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MAGAZINE

NOVEMBER 1958

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PIPER APACHE FOR 1959

See page 28

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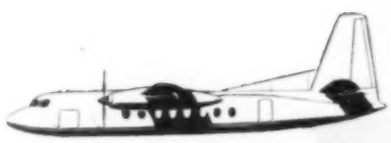

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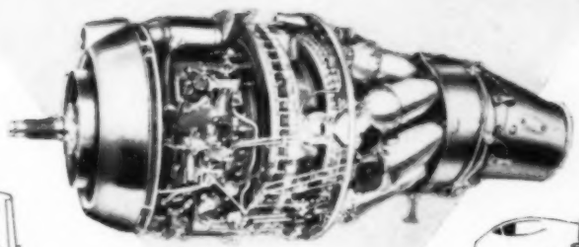

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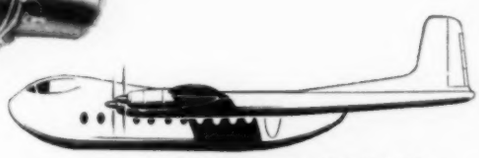

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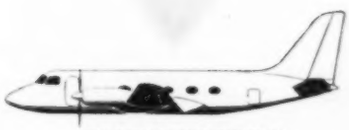

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Harry B. Combs (*left*), owner and president of Combs Aircraft, Inc., and Wayne M. Brown, executive vice president.

Maximum usable space is available for storage and shop operations through unique cantilever construction of the Combs hangar.

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Located on Denver's beautiful Municipal Field, Combs Aircraft, Inc., is a preferred stop for private aircraft from all over the Rocky Mountain region. Started in 1938 by Harry Combs as a flight training school with one Aeronca trainer, Combs Aircraft is now one of the largest fixed base operations in the nation. It offers 24-hour refueling service, in grades 80, 91, 100 and 115, and regularly maintains all planes through Twin Beech.

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AIR Report

Significant Trends and News

NORTH AMERICAN SABRELINER, 6-10-place, 500-mph., 1,400-mi.-range twin-jet utility transport-trainer, has been ordered into production by the Air Force and designated as the "T-39." There is an impressive potential demand on the civilian market for the small jet transport, and North American has indicated it would CAA-certificate the Sabreliner and offer it commercially after military production gets under way. It has a wing almost identical to that of the F-86 fighter and is powered by two jet engines mounted on the fuselage behind the cabin, a la Caravelle. The prototype began flying in September with two General Electric J-85 engines. The Sabreliner has a swept wing of 42-ft. span and is 43 ft. long. North American has made no mention of commercial pricing but it would probably be in the $500,000 bracket.

NEW PIPER 2-PLACE "PAPOOSE," for which a market evaluation is now being made by the factory, will be a low-wing side-by-side tricycle powered by a 90-100-hp. engine featuring new construction methods and described by Piper as "being very attractive with comfort for two not found in current two-place airplanes." Target price is "well under $5,000," says Vice President Howard Piper, in charge of research and development, who adds: "Unless we can build the airplane for a much lower price than that of any current two-place models, we do not feel there is much market for a ship of this type. We are concerned about running into competition with the used aircraft market where good 4-place over-120-mph. aircraft are available in the $5,000-$7,000 class." Radically new construction methods are being studied by Piper's research center at Vero Beach, Florida, and several years would be required before the Papoose could go into production.

MORE CESSNA T-37 TWIN-JET TRAINERS have been ordered in a new $12,345,000 Air Force contract, extending production well into 1960. The Cessna factory is currently producing one 400-mph. side-by-side T-37 every 11 hrs. 12 mins. of the working day. The trainer is powered by two Continental J-69-T9 jet engines of about 900 lbs. thrust each. . . . **COMPLETE NEW COMMUNICATIONS AND NAVIGATION EQUIPMENT INSTALLATION** for Cessna T-37 jet trainers has been approved by the Air Force and will include a new instrument panel. New equipment was not identified.

CESSNA SALES REACHED ALL-TIME HIGH OF $86,000,000 during fiscal 1958, as compared with $70,000,000 for 1957, according to estimates last month when directors voted a 10% stock dividend in addition to a quarterly dividend of 40 cents. Earnings reached a record $6.15 per share vs. $5.04 for 1957. Dwane Wallace, president, said commercial aircraft sales showed a $5,600,000 increase

(Continued on page 54)

General Aviation Flies 3 Times More Hours Than Airlines

General aviation in the United States flew three times more hours and almost twice as many miles as the airlines in 1957, the figures being 10,900,000 flight hours and 1,410 million miles for general aviation as compared to 3,600,000 flight hours and 550 million miles for domestic airlines. The Utility Airplane Council of the Aircraft Industries Association estimates that general aviation will fly about 11,500,000 hrs. in 1958.

The Civil Aeronautics Administration's preliminary figures from its 1957 survey of general aircraft usage compare 1957 and 1954 to show significant increases during the period and are as follows:

	Hours in Millions		Miles in Millions	
	1957	1954	1957	1954
Domestic Airlines	3.6	2.7	785	550
General Aviation	10.9	8.9	1,410	1,110
General Aviation by Type of Flying—				
Business	4.9	3.9	720	550
Pleasure	2.1	1.9	240	210
Commercial	2.0	1.8	250	225
Instructional	1.9	1.3	200	125

FLIGHT MAGAZINE

NOVEMBER, 1958 VOL. 47, No. 11

THIS MONTH'S COVER is a head-on flight portrait of the 1959 Piper Apache, popular small twin powered by two 160-hp. Lycoming engines and featuring improved soundproofing and new instrument panel.
—(Piper Aircraft Photo.)

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GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager; LOUISE ROBERTSON, Circulation; E. H. PICKERING, Consultant; P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas — Telephone TAylor 3-6191.

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WING TIPS

GUSTY DAYS. Make your climb more gradual and maintain extra air speed. Gusty winds can cause not only variations in wind velocity and direction, but irregular vertical air currents, too. One, or a combination of these factors, can result in a stall if you don't keep a safe margin of air speed.

HOT, HIGH & HUMID. High temperature, altitude and humidity all make for low *air* density, thereby decreasing wing lift. When these conditions exist, be sure to allow for a longer take-off run, and (or) a lower take-off weight.

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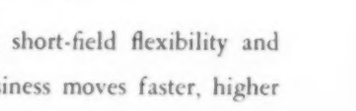

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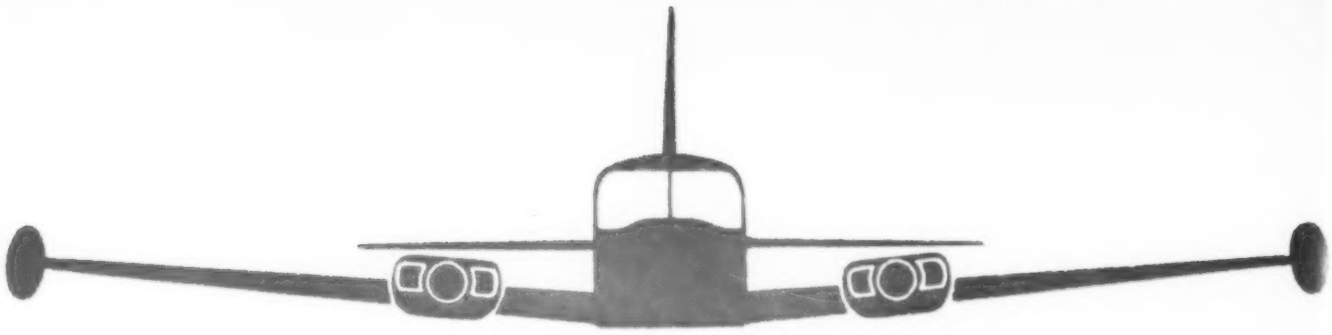

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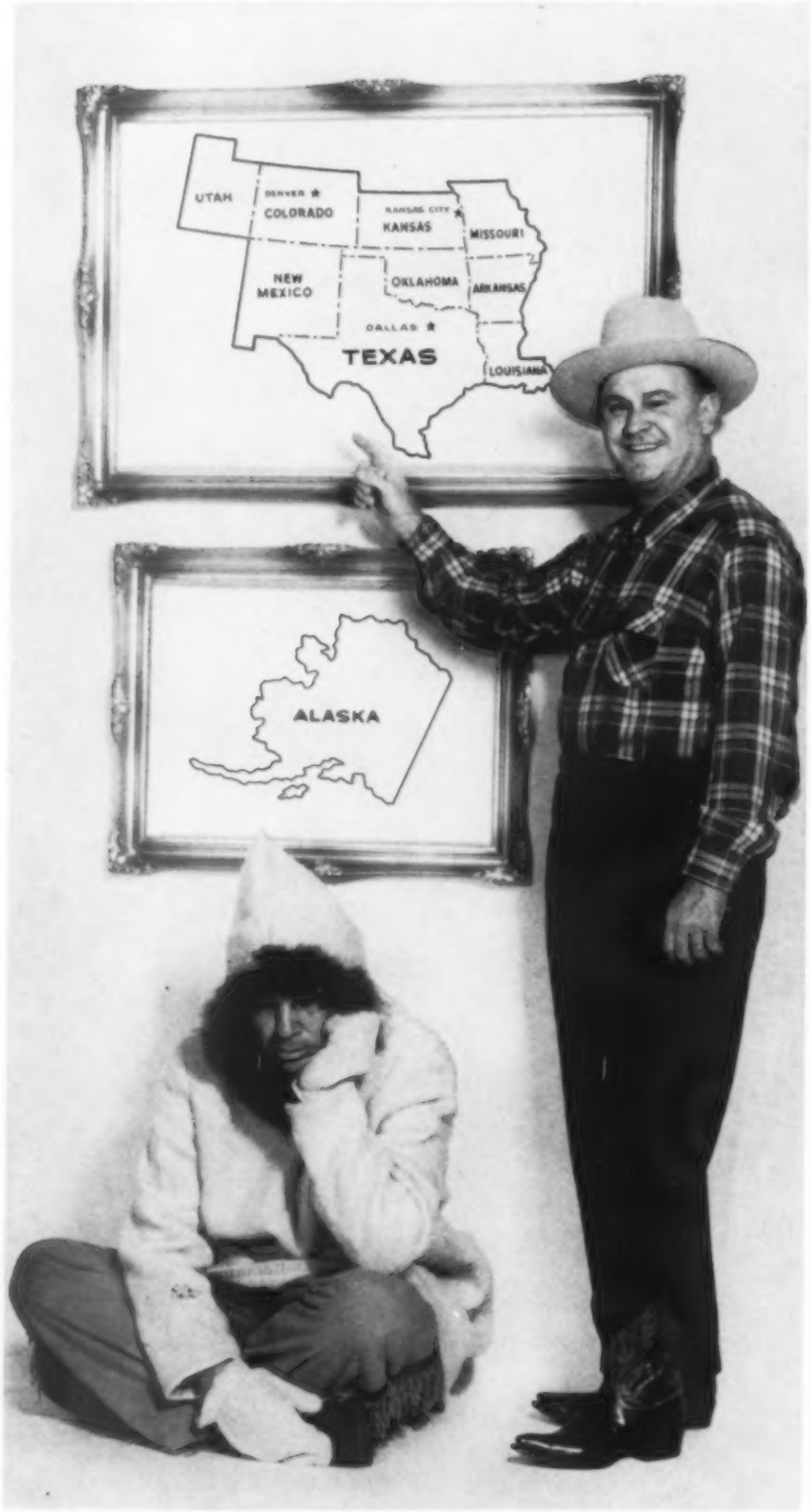

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A long time ago, we saw this Alaska thing coming. With the aid of some friendly manufacturers, we got ready for it in our SAC distribution territory by annexing to Texas the states of New Mexico, Oklahoma, Arkansas, and Louisiana. Quick, geographical arithmetic dictated that we also establish Rocky Mountain and Midwestern outposts at Denver and Kansas City, tying-in with Colorado, Utah, Missouri, and Kansas.

The upshot is that we now distribute flying's most reliable parts and accessories to fixed base operators and airlines in a great 9-state complex encompassing 901,664 square miles. This compares with a piddlin' 586,400 square miles in Alaska. Thus, the dejected Eskimo (our John Clement) and the happy Texan (our Exec VP George W. Jalonick, III).

PS: Seriously, we're proud of Alaska and Alaskans — and we'll tell 'em so if they'll come to the 1958 Aviation Distributors & Manufacturers Assoc. convention, Nov. 19-21 at Dallas' Statler Hilton Hotel.

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Just among ourselves

Showdown

TIME is running out on general aviation insofar as adequate representation in airspace matters is concerned. It is plainly evident that as of this moment lip service is about all general aviation has had from those running the shows.

These columns pointed out last month how the new program of segregating military jet training was being formulated without any consultation with civil aviation interests. Study teams composed of military-CAA personnel spend up to three months deciding what airspace would be reserved and restricted and what changes would have to be made in the airways system. These determinations are followed by public hearings where the forces of general aviation can holler their heads off but minus the right to vote. The case then goes to Washington for final action.

Actually there are three broad segments of aviation endeavor with heavy stakes in the carving up of our airspace and in the rules of the road we must follow. These are the military, the airlines and the broad field of non-scheduled civil aviation.

When it comes to men and money the military services are the most powerful. Next in power is the scheduled airline industry which is made up of relatively few carriers operating some 2,000 transport aircraft. It's a matter of economic life or death to them and their basic missions to get their share of the sky and a set of rules that they can live with. Like the military, their missions are clear-cut, well defined and highly organized. Their requirements can be pinned down to extremely accurate figures and projections.

Not so with the 65,000 active itinerant aircraft and their owners. This dynamic and many-faceted segment of aviation now in full flower is difficult to analyze or to predict just where it is going in any particular span of years or exactly what its future requirements will be.

So we find this situation — the very phase of aviation that should be completely organized to protect itself, or to get its fair share of the airspace pie, is the weakest from an organizational standpoint. While this publication has never believed it possible to create a single, powerful voice on all general aviation matters, we do submit that there is a desirable middle-ground of basic agreement on basic principles that realism and intelligence could bring into being. But we hobble along with a babel of voices from a hodge-podge of aviation organizations, each jealously guarding its independence and prerogatives in an atmosphere of suspicion, distrust and petty jealousy. Perhaps lip service is all this branch of civil aviation deserves if it fails to change with the times.

The big point is this: The most important decisions in aviation history, policies which will dictate how, when and where we fly in the future, are now being made. The new Federal Aviation Agency, the Airways Modernization Board and an entirely new philosophy of civil aviation control and regulation are accomplished facts. Decisions affecting huge blocks of precious airspace are now being made. Airways are being re-routed, high density areas designated and altitude limitations are being imposed. Plans are being made now for user taxes and other sources of taxation. But the average airplane owner and pilot, whether he be a corporate executive, an ordinary businessman or a modern farmer has very little, if any, influence among those who control his future use of the airspace and landing facilities.

In days gone by, the old method of joining an aviation organization that presumably represented your particular interests and leaving policies up to an executive or professional secretary worked fairly well. This method provided for the joiner a sense of security just in "belonging." If the member could vote, he'd sometimes go to annual meetings (if the organization held democratic annual meetings) and elect a slate of officers. These in turn usually left everything up to the secretary, who in most cases had to beat the drum for memberships, collect the bills, pay out the money, get out the newsletter and in his spare time speak for the organization in Washington or at the industry meetings. It was completely normal for a dozen or so aviation organizations to develop from the broad, heterogenous field of U. S. non-scheduled civil aviation — both trade and consumer groups.

We now have come to the showdown point. How in the name of heaven are the new agencies going to deal with a dozen aviation organizations on general aviation problems with each organization beating on the door and coming to official meetings with twelve different policies and twelve different spokesmen? Can all of these diverse organizations get together or can't they? We don't think they can — because of the jealously protected prerogatives and the ingrained fear of losing their identity in a "single-spokesman" organization. While the CAA and the forthcoming Federal Aviation Agency and other governmental agencies involved would probably welcome a single spokesman, we might as well face up to it and admit there won't be one. The only other alternative is to work long hours trying to find those areas where agreement on basic policy and basic principles can be formulated and presented in a statesmanlike manner. But even this is too much to hope for. Too many people are in their own little narrow rut, beating their own little drums for memberships and fiddling away on petty personal problems while Rome burns.

It is not a pretty sight but let's face it. Top level Washington agency people might, in their hoped-for "total" view of our knotty domestic aviation problems, particularly in airspace and regulations, take the bull by the horns and develop their own formula for general aviation to bring in some kind of majority opinion that would in the main be acceptable by the users of the airspace and by the people whose livelihood depend upon business, agricul-

tural and industrial users of airplanes. This is the only other practical alternative for general aviation to provide the vehicle or machinery for expressing its opinions on these matters and to find a way to agree as much as humanly possible among themselves before going out and speaking intelligently for the record and for forceful insistence that the interests of general aviation are adequately protected.

Neither the military nor the airlines have this worry. They are geared to look after their interests, and will. General aviation is not. Until it is, general aviation will have to be satisfied with its second-class citizenship and with the crumbs that fall off the table where all the big decisions are being made.

Salute To First Jet Airliners

AVIATION history was made in October when jet airline travel became a reality for the first time — you could buy a jet ticket to Europe at regular passenger rates.

Pan American World Airways became the first airline to operate daily jet schedules, inaugurating the jet airline age with its new Boeing 707's. British Overseas Airways Corporation had inaugurated its jet schedules between New York and London a few days earlier but BOAC was not yet operating daily schedules. BOAC began with the British-built deHavilland Comet 4.

Problems developing at the start of jet service may become serious in some areas, particularly in the successful financing of jet airliners at five to six million dollars per aircraft and in a belated awakening to runway length requirements, especially at airports where 90-100-degree summer heat is common. But the high stakes involved will force acceptable solutions to these problems and jet service will become firmly and widely established by the end of 1960.

Faster travel is the jet airliner's major contribution to aviation progress. The 500-600-mph. airliner almost cuts long-haul transoceanic trip times in half, bringing European cities within 7 hours of New York. But jet travel is revolutionary in many other ways. Passengers travel in nearly absolute quiet, almost as if suspended in space. Jet airliners are also more comfortable because they fly higher and atop practically all of the weather.

As wonderful as they are, we believe the new jets will eventually cause millions of people to travel by air who would never fly in slower airliners. The new Boeing 707, for example, is a very large airplane as well as a very fast one — a single 707 can carry as many people between New York and Europe in a year's time as a giant ocean liner of the largest class. Able to visit far-off places and return within a few days, people who never had the time for slow travel will want to use the jet. In the process of multiplying the passenger-miles, the big jets are expected to prove themselves capable of reducing passenger costs. Eventual lower fares, in turn, are expected to produce more passenger multiplication. Still faster airplanes will be developed to capitalize on the great new traffic volume which appears inevitable.

Nothing less than tremendous changes can be expected from jet travel, which is shrinking the world by a considerable margin in a single stride of progress. These changes will make their impact on many of the world's activities as fast, cheap travel brings nations and people ever closer together, all but eliminating the barriers of time and distance.

We salute the genius and foresight among U. S. and British manufacturers and airline operators which made possible the jet transport's many advantages. They have ushered in a great new age, one of history's truly epochal turning points in the advancement of civilization.

Whose Responsibility?

OKLAHOMA'S Senator Mike Monroney, who successfully spearheaded the Federal Aviation Act through the last Congress, sincerely believes that the next Congress will override President Eisenhower's veto of the Federal Airport Bill. He made this statement during the National Airports Conference in Norman, Oklahoma last month.

The good Senator advised his audience that he bases this opinion on the assumption that aviation and political leadership throughout the nation would start a ground swell of backing especially because of the strange philosphy enunciated by the President in his veto message. Mr. Eisenhower stated that it was high time the communities built their own airports without Federal participation.

It is apparent that Mr. Eisenhower has been getting some mighty poor aviation advice. In effect, the President says it's just fine to have a national system of highways and waterways but a national airport system is unnecessary and the local people will just have to build their own! If he had urged a revision of the program, such as limiting Federal participation to landing areas, approach zones or some other modifications for the sake of realistic economy, most sensible people would go along with him. But to make an empirical statement that airports are strictly a local responsibility is to deny the national defense and public convenience and necessity aspects of airports and our traditional national policy enunciated time and time again by the Congress.

There is comfort in the knowledge that the Congress still runs this country. With adequate legwork we can get a sensible national airport plan back on the track, no matter what Mr. Eisenhower thinks about it.

Airmen's Calendar

Nov. 10-12 — 2nd Annual International Symposium on the Physics and Medicine of Upper Atmosphere and Space, sponsored by Air Force School of Aviation Medicine and Southwest Research Institute, San Antonio, Tex.

Nov. 10-13 — 11th Annual International Air Safety Seminar, sponsored by Flight Safety Foundation and AMB National Aviation Facilities Experimental Center, Atlantic City, N. J.

Nov. 11-14—19th Annual Convention, National Aviation Trades Association, Pfister Hotel, Milwaukee.

Nov. 13-29 — Island Hopping Tour of Caribbean, Miami to Port of Spain, Trinidad and Return. Contact Harry B. Collins, Air Cruise Director, Florida Aero Club, 375 N. E. 154th St., North Miami 61, Fla.

Nov. 19-21—32nd Meeting, Aviation Distributors and Manufacturers Association, Statler Hilton Hotel, Dallas.

Nov. 28—4th Convertible Aircraft Congress, Franklin Institute, Philadelphia.

Nov. 28-30—Snowbird Soaring Meet, Harris Hill, Elmira, New York.

Dec. 3-5—2nd National Symposium on Global Communications, Colonial Inn, St. Petersburg, Fla.; 60 Technical Papers, 50 Exhibitors.

Dec. 5-6—Texas State Aviation Association Annual Convention, Ft. Clark, Brackettville, Tex.

Dec. 17—22nd Wright Brothers Lecture, Smithsonian Institution, Washington, D. C.

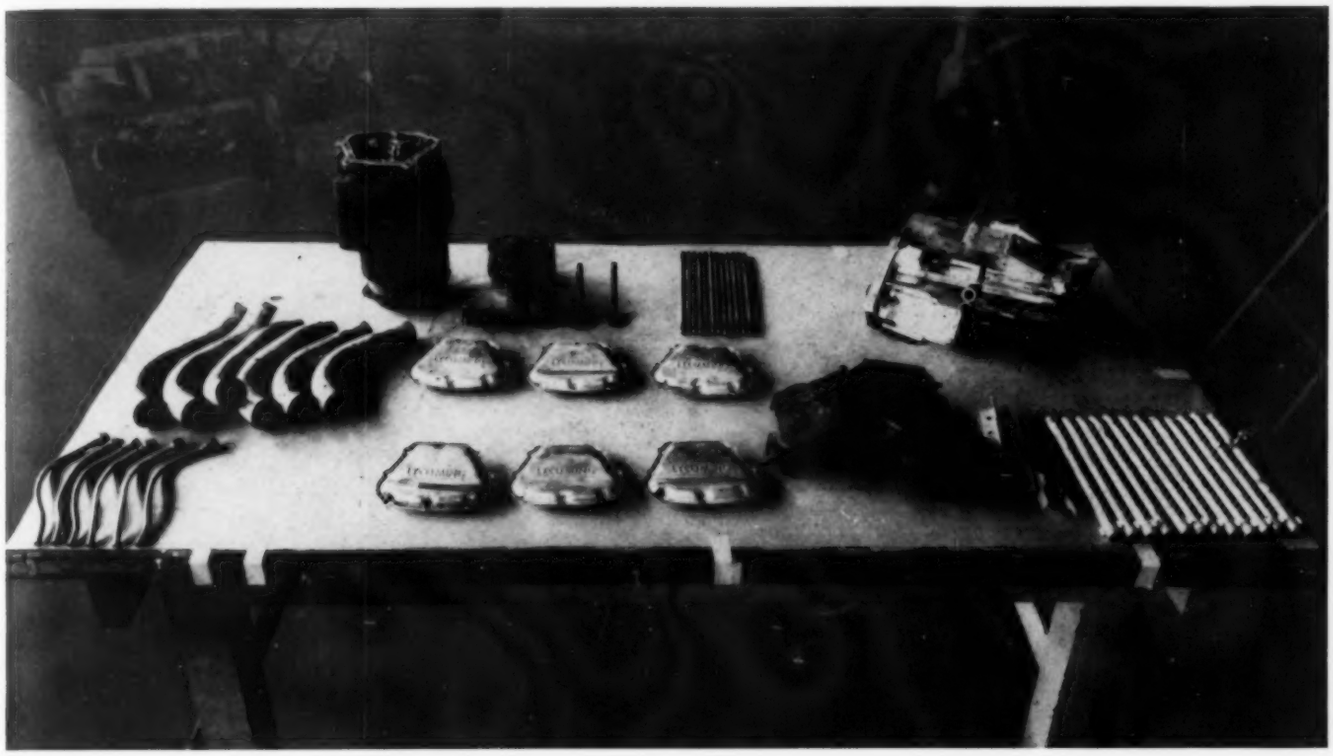
Dec. 17—Wright Memorial Dinner, Sheraton Park Hotel, Washington, D. C.

Jan. 26-29—27th Annual Meeting, Institute of the Aeronautical Sciences, Sheraton Astor Hotel, New York.

May 4-7—5th Annual Flight Test Instrumentation Symposium, Instrument Society of America, Olympic Hotel, Seattle, Wash.

May 20-22—2nd Annual Jet Age Airport Conference, ASCE, Shamrock Hilton Hotel, Houston.

LYCOMING engine services



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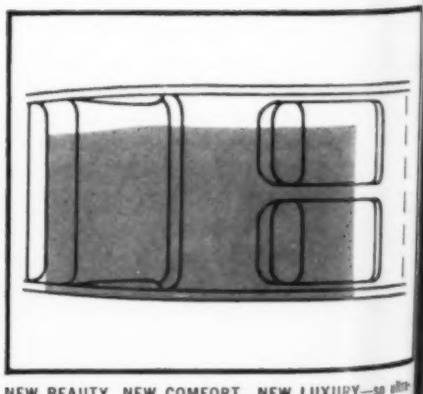
BIG NEW CESSNA 172 WITH NEW STREAMLINES

What an airplane! It's the big new Cessna 172... largest in its class... with all-metal construction... exclusive Land-O-Matic and Para-Lift ...high performance... and clean aerodynamic design—now more streamlined than ever before! See that sleek new cowling? That's just one of many new developments in this great new Cessna.

Price: just $9,250 with std. equip., f.a.f. Wichita. Your Cessna dealer will be happy to demonstrate the biggest, brawniest, most beautiful airplane in the low-price class—the all-metal Cessna 172 for 1959.

Why not look at all *seven* great Cessna models? Ask about Cessna lease plans, too. See Yellow Pages of your phone book. Or write Cessna Aircraft Company, Dept. FM-2, Wichita, Kansas.

NEWLY DESIGNED, SHOCK-MOUNTED PANEL—with all flight instruments located directly in front of you. Easy to read, easy to understand—probably with fewer items requiring attention than in your car! Safety control lock is standard. Ample room for full-gyro panel and optional navigational instruments.

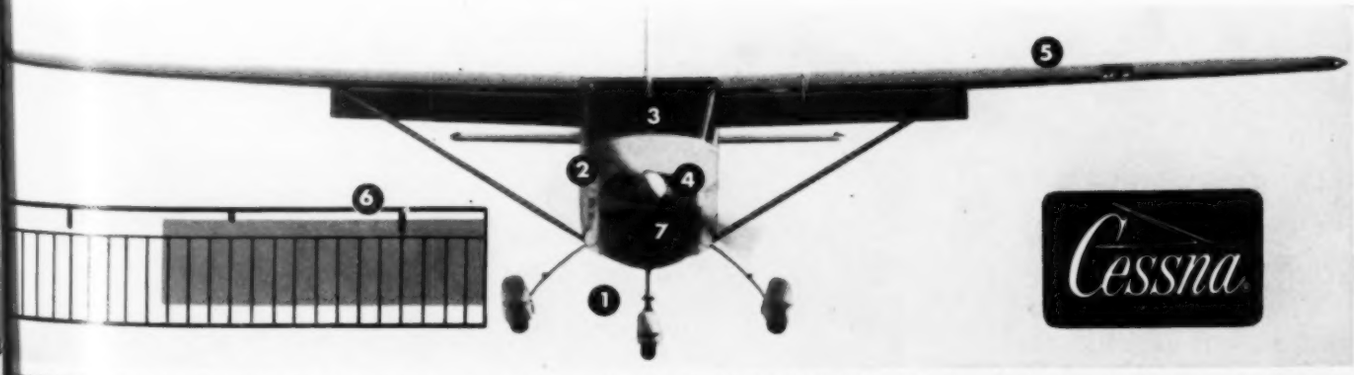


NEW BEAUTY, NEW COMFORT, NEW LUXURY—so ultra-modern you'll have to see it for yourself—no photo can do it justice! Inspired by the sweeping Flight-Line styling that graces the exterior. Biggest in its class! All seats finger-tip adjustable! Two yard-wide doors! Rich with other features!

the Cessna **HIGH-STABILITY WING**

ATEST 172 OF THEM ALL!

NE ESIGN AND FLIGHT-LINE STYLING FOR 1959



Cessna

ER FEATU EXCLUSIVE IN ITS CLASS—Patented -O-Matic (1) s you drive up into the sky . . . drive down. etal constru n (2), very important for safety and high e value. Ex nt visibility (3) through 1200 sq. in. of ating winds d. Six-cylinder Continental engine (4) with non-stop endurance world record. Cessna's High-Stability Wing (5)—biggest in its class, best seller of the past year. A high wing, too—the easiest kind of wing to fly. Ask any bird. Para-Lift flaps (6), 100% larger than average, can float you down twice as slowly as a parachute! New, streamlined nose configuration (7) of cleaner aerodynamic design—with a new, broad-shouldered styling to match this Cessna's high-performance spirit. Only Cessna can give you such features at such a low price. And there are many more! Let your Cessna dealer show you all of them.

Test your cross-country memory

Can you name this airport?

Clue: *the citrus fruit center it serves is the spring training site of the Washington Senators baseball team. (Answer below)*

Now test your aviation oil memory: Do you remember the two important reasons why Gulf oils are better for your engine?

1. In addition to providing efficient, thorough lubrication, Gulf aviation oils help keep engines *clean*—and safe!

2. Gulf-clean engines can go longer between overhauls, because there's less wear and tear on engine parts.

Choose either new Gulfpride Aviation Oil Series D, the detergent oil, or Gulf Aircraft Engine Oil, the straight mineral oil—both keep your engine Gulf-clean and safe.

The airport pictured above is the Orlando, Florida Municipal Airport, two-and-half miles east of the city. It has five paved runways, the longest of these being 5,500 feet.

Here you'll find friendly Gulf service under the supervision of Howard Showalter, president of Showalter Flying Service.

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Fly safely with a Gulf-clean engine

NEW SPECIAL SERVICE FOR PILOTS MEET "MISS SPARTAN"

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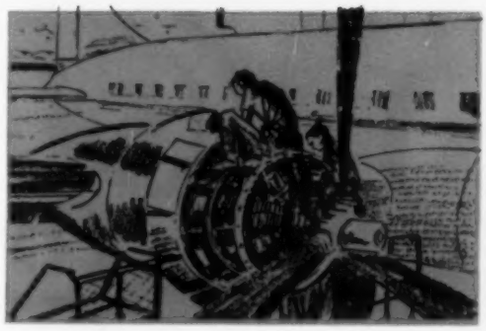
For service beyond price, schedule your aircraft for complete one-stop service at Spartan in Tulsa. The high standards set by Spartan's skilled specialists have meant greater safety, better performance and lower operating costs for thousands of aircraft owners and pilots. Quality gets first consideration at Spartan — and Spartan prices are right for quality work.

Serving business aviation since 1928, Spartan service includes overhaul, remodeling, modification, repair and testing — backed up by excellent shop facilities and quality workmanship.

Call, **write or wire Spartan today!**



SPARTAN AIRCRAFT COMPANY

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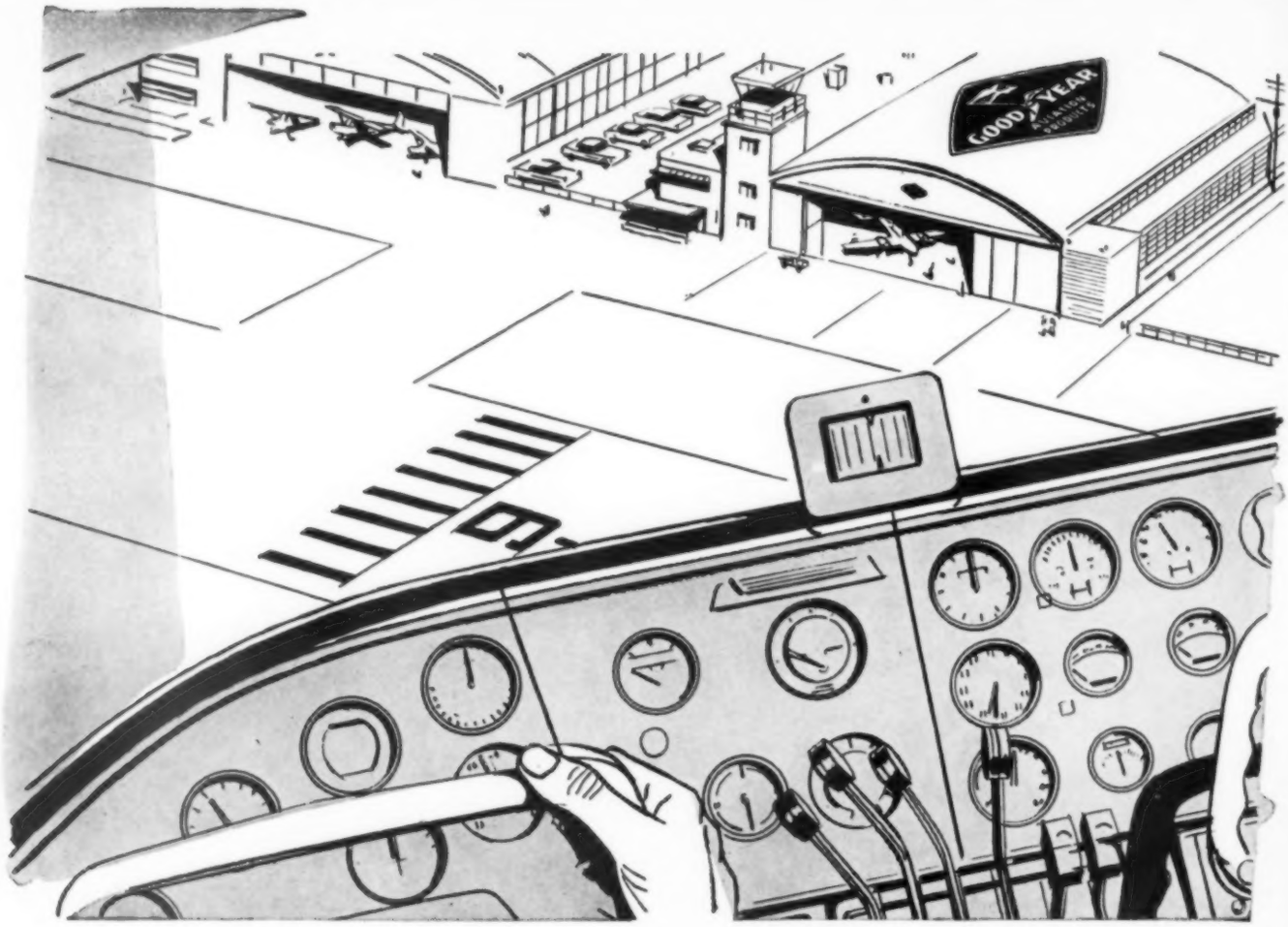

Green light for dependable service

The "green light"–your landing clearance–is always a welcome sign.

And there's another welcome sign here, too–the Goodyear "Sign of Service."

For at home or away, you have learned from experience that the man who displays this sign is dedicated to serving well your aviation needs–large or small–private or commercial.

It means that here you will find the highest quality aviation products – not only tires, tubes, wheels and brakes–but also a wide variety of other original equipment parts and accessories for the nation's vast fleet of private, business and executive aircraft.

It means that here you will find, at reasonable cost, prompt, efficient and courteous service backed by a time-proved reputation.

Wherever you fly, look for this sign–the Goodyear "Sign of Service"–your "green light" for dependable service.

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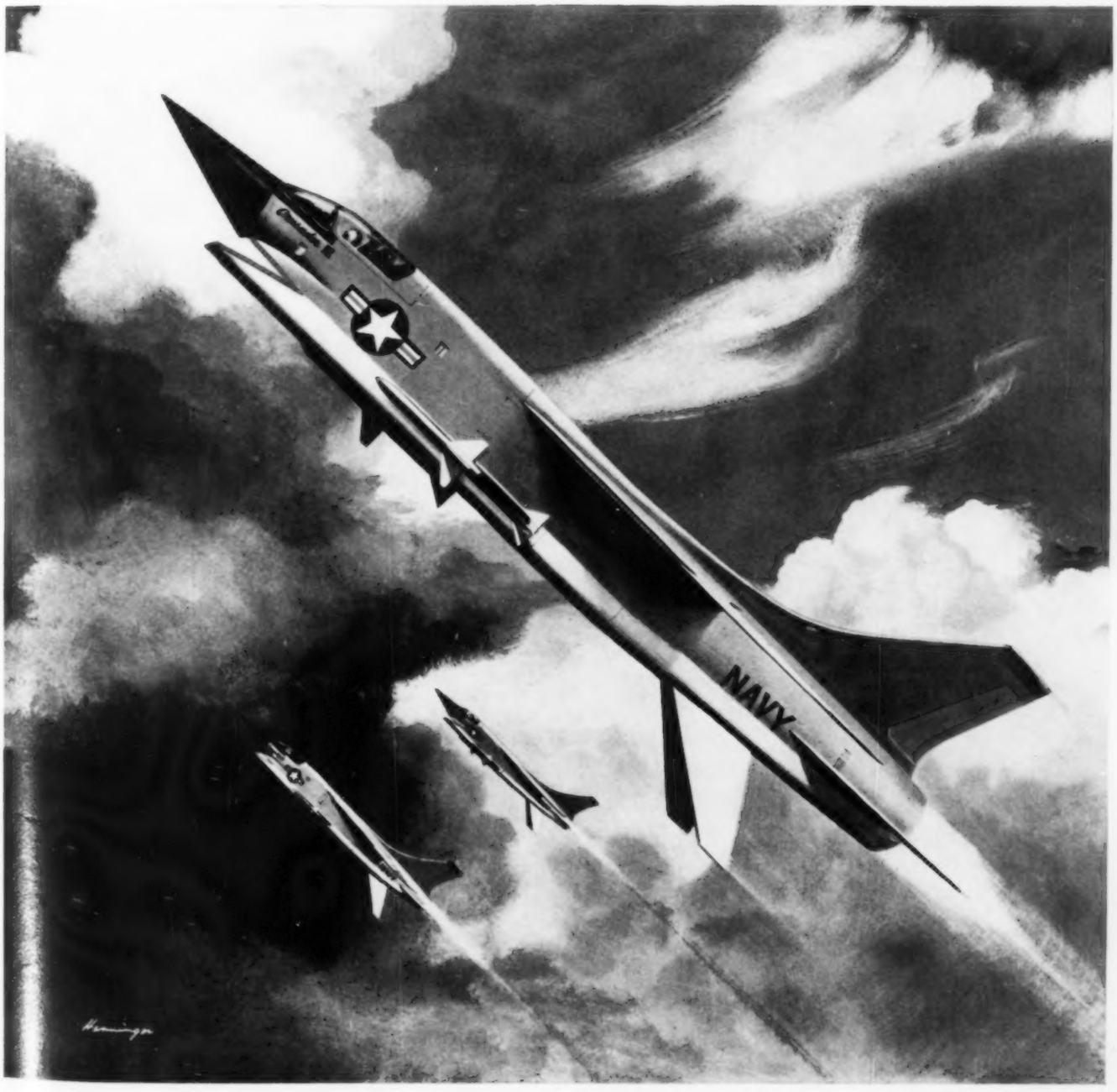

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FLIGHT CONTROLLER

Compact flight controller contains ON-OFF switch, "push-to-turn" control, pitch and roll trim knobs.

MODE INDICATOR

Simple "push-to-test" lights provide ready reference to autopilot status.

Newest additions to the growing list of Lear Autopilot users are the Army's versatile de Havilland DHC-4 "Caribou" and the Beechcraft L-23 "Bonanza."

Basically the same autopilot as the F-5 which proved its reliability and accuracy in jet fighters, this installation (Army designation ASN-22) in the flying Army's fleet of fixed-wing aircraft is dramatic proof of the system's versatility. The Army has also selected a modified version of the F-5 (Army designation ASN-23) for automatic stabilization of the H-34 "Choctaw" rotary-winged aircraft.

The system weighs less than 70 pounds—lighter by far than any comparable autopilot. It is ruggedized for extremes in environment, operating with equal efficiency in tropical climates, sub-zero cold or extreme altitude. This modification of proven Lear equipment will bring greater utility, higher in-flight efficiency, and greater economy to Army aviation.

For further information or your nearest sales engineering office, write:

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LEAR

The EXECUTIVE TWIN that is outselling them all!

Never before in the history of AERO COMMANDER has public acceptance been so great on any AERO COMMANDER model.

NOW, THE NEW 500 provides famous Aero Commander high-wing performance and stability in a full-sized, utility airplane at a NEW, LOW COST! Here is multi-seat capacity—2,150 lbs. of useful load—in a 6,000 lb. aircraft which cruises over 200 mph., flies more than 1,100 miles without refueling, takes off and lands, clearing 50-foot obstacles, in 1,400 feet!

The 500 will fly at 24,000 feet—climb 1,400 fpm.! On only one of its 250 hp. Lycoming engines, it will climb at 310 fpm.—fly safely at 8,000 feet! Complete dependability!

One look at the new Aero Commander 500 will convince you that this is not a scaled down or cheapened model. Instead, the model 500 has the same airframe as its big sisters from the Aero Design and Engineering Company production line.

Direct operating cost of the model 500 is amazingly low when compared with competitive low-priced aircraft. It offers the lowest seat-mile operating cost of any twin-engine aircraft.

This great new quality addition to the famous line of Aero Commander models provides *big twin* features at small twin cost.

And the Aero Commander 500 delivers more useful load at less cost per pound than either of its two nearest competitors!

Feature for feature the Aero Commander 500 is the most outstanding aircraft available today among the light twins and you owe it to yourself to learn more about this great aircraft priced at only $64,750. Our representative will be happy to show you the advantages your company can derive from owning its own Aero Commander 500.

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First photo of 1959 Piper Apache shows its new paint scheme, available in white with red, blue, green or brown trim. Improved soundproofing and new instrument panel are major improvements. —(Piper Aircraft Photo.)

New Piper Apache For 1959

NEW 1959 versions of Piper Aircraft Corporation's widely-popular small twin, the Apache, are being delivered this month and feature significantly-improved engine noise reduction both in the cabin and outside and a completely revised instrument panel.

Prices for the all-metal twin, powered by two four-cylinder Lycoming O-320-B engines, each rated at 160 hp. at 2,700 rpm. for all operations, are up $1,000 to $1,120 over last year's 1958 models. The 1959 prices are $36,990 for the Standard, $41,875 for the Super Custom and $42,625 for the AutoFlite. The latter features factory-installed Piper AutoControl, a 4.5-lb. all-transistorized automatic flight system which derives its "intelligence" from the artificial horizon and directional gyro.

Piper, which features the automatic flight system in its single-engine models also, is the first lightplane manufacturer to deliver airplanes with "built-in" automatic flight controls. Controlling the ailerons, the Piper AutoControl will hold the airplane straight and level or, by a turn-knob control, will turn the airplane up to a standard in-

1959 Piper Apache
Factory Data

Prices: Standard $36,990, Super Custom $41,875, AutoFlite $42,625 (see notes for equipment). All models powered by two Lycoming O-320-B 4-cyl. engines, each rated at 160-hp. @ 2,700 rpm. for all operations.

Gr. Wt., lbs.	3,800
Empty Wt., lbs.	2,230
Useful Ld., lbs.	1,570
Std. Fuel Cap., gals.	72
Fuel with aux. tanks, gals.	108
Top Spd., mph.	183
Cr. Spd., 75% hp. @ 7,000 ft., mph.	171
Stall Spd., mph.	61
Rate of Climb, fpm.	1,260
SE Rate of Climb, fpm.	180
Abs. Clng., ft.	19,000
Svc. Clng., ft.	17,000
SE Abs. Clng., ft.	5,500
Fuel Cons., 75% hp., gph.	18.8
Range, 72 gals., 75% hp., SL, mi.	640
Range, 72 gals., economy, mi.	840
Range, 108 gals., 75% hp., SL, mi.	940
Range, 108 gals., economy, mi.	1,260
Take-Off Run, ft.	1,190
Landing Roll, ft.	750
Best Rate of Climb Spd., mph.	100
Best SE Rate of Climb Spd., mph.	95
Bag. Cap., lbs.	200
Bag. Space, cu. ft.	25
Cargo Space, rear seat out, cu. ft.	80
Span, ft.	37
Length, ft.	27.1
Height, ft.	9.5
Wing Area, sq. ft.	204
Wing Ldng., lbs. sq. ft.	18.6
Pow. Ldng., lbs. hp.	11.9

NOTES: Performance is for gross weight at sea level standard air unless noted. Standard model includes 160-hp. engines and 72-gal. fuel capacity. Super Custom includes 108-gal. fuel capacity and radio as follows: Lear ADF-12E; Narco Mark II O'nigator and 27-channel Narco Simplexer. AutoFlite includes same as Super Custom plus transistorized Piper AutoControl automatic flight system.

Apache tops 183 mph. and cruises 171 mph., powered by two 160-hp. Lycomings with 1,570-lb. useful load at 3,800-lb. gross weight. Standard Apache, at $36,990, has 72-gal. fuel capacity. AutoFlite Apache, at $42,625, has 108-gal. fuel supply, complete instrumentation and radio and built-in automatic flight control system.

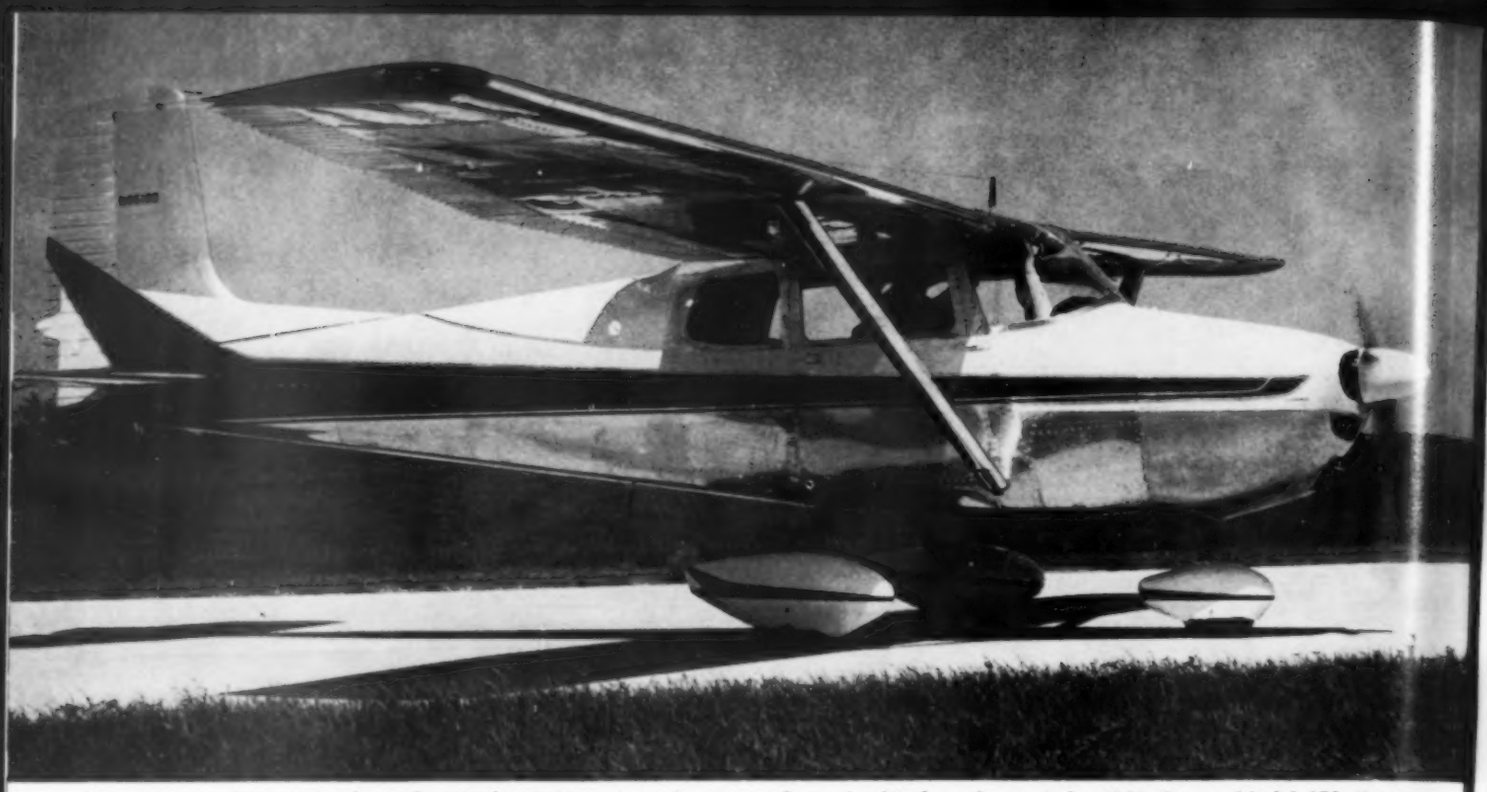
—(Piper Aircraft Photo.)

strument rate turn of 3 degrees per second. The unit also features a heading lock which, when engaged, holds the airplane precisely to any course selected. This low-priced electronic unit adds only $750, installed, to the airplane price, and the AutoFlite Apache's price of $42,625 includes its cost and factory installation.

Piper has achieved significant engine noise reduction for 1959 through three different improvements. Completely new exhaust augmentors have perforated interior walls wrapped in a half-inch of fiberglass to absorb the "bark" of the exhaust. Windshield and cabin window thickness has been doubled, the thickness being one-quarter inch for the windshield and .200-in. for the windows. In addition, extensive underseal treatment has been given to the nose section opposite the propeller tips and soundproofing material now com-

(Continued on page 48)

Completely new Apache instrument panel groups flight instrumentation at left, radios at center and engine instruments at right.



New nose cowling air intake and revised exterior paint scheme are shown in this first photo of the 1959 Cessna Model 172. Price is $9,250 for the standard version of the 4-place, 145-hp. Cessna. —(Cessna Aircraft Photo.)

New Cessna Model 172 For 1959

FIRST of the new models in Cessna Aircraft Company's line of seven commercial models to be introduced for 1959 is the improved 4-place, 145-hp. Model 172, which was unveiled on November 8-9 in dealer showings throughout the country. Other models will be introduced in the months to come.

Major refinements in the new 172 are a new engine cowling and a new instrument panel. Performance remains the same. The price is $9,250, up from the 1958 model's price of $8,995.

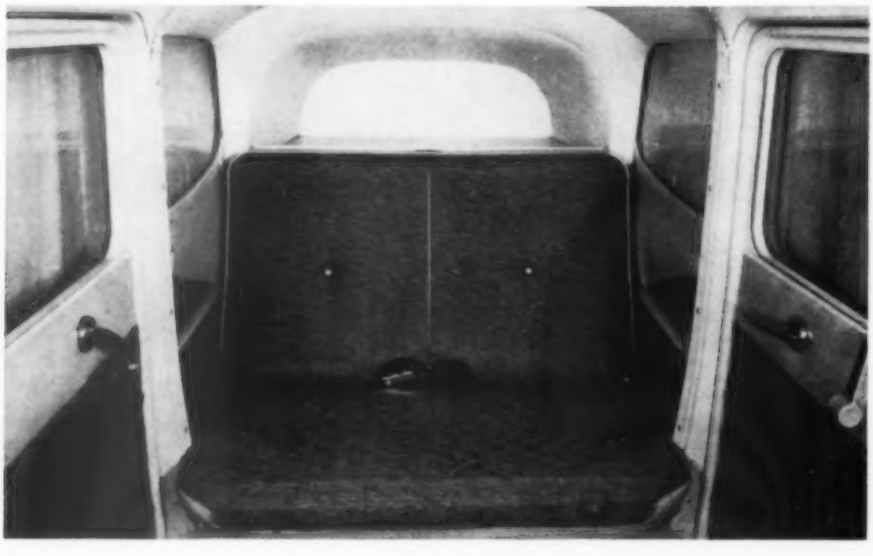
The new cowling gives the airplane a slightly different appearance at the nose, as the pictures on these pages indicate. The cowling was redesigned with a larger opening in front for a greater volume of cooling air.

Inside, the new instrument panel groups all flight instruments on a shock-mounted panel in front of the pilot, with engine and systems instruments moved across to the right-hand side and arranged for rapid scanning. Panel control knobs are moved to the right at the bottom of the panel. A "T" handle is used on the parking brake control for easier operation. A new control lock is standard. Electric fuel gauges are standard equipment and are more accurate than the direct-indicating gauges formerly used. A light indicator is used for the generator instead of an instrument.

Finished in black Royalite to minimize glare, the new panel's flight grouping offers several blanks for instruments to be added and has space for two optional radio tuners on the lower left and for a third above the glove compartment on the right. Rheostat-controlled red instrument lights are grouped in the dome light console.

A new Wright "Executive" radio, with 60 channels, is offered for the first time as optional equipment.

Landing gear features new die-cast wheels with gear-tooth brakes as standard. Matched gears and teeth around the perimeter of the discs and the in-



With track-mounted front seats rolled forward, photo shows spaciousness in 4-place 2-door cabin of the Cessna 172. —(Cessna Aircraft Photo.)

Flight view of the 1959 Cessna 172, which has a top speed of 135 mph., and a recommended cruising speed of 124 mph. At 2,200-lb. gross weight, it has 940-lb. useful load. Fuel capacity is 37.5 gals.

—(Cessna Aircraft Photo.)

side of the wheel castings replace keys and clips previously used to hold discs in place. The gear-toothed brakes offer more positive action. Tubeless nylon tires are standard.

Exterior paint styling is offered in a choice of seven colors, Snowcrest white being the common stripe with a choice of Paris black, Mahogany brown, Forest green, Terra Cotta brown, Damask red, Colonial blue or Crimson red.

Interiors come in a choice of Autumn brown with a light tan vinyl and mylar trim with beige carpeting and ivory headliner or a Sage green with light tan and mylar trim with black carpeting and ivory headliner. Cessna says a new and thicker foam rubber underlay has been bonded to the carpeting for a more luxurious and sound-absorbent floor covering, outer edges of the carpeting being finished in a heavy binding and areas adjacent to the seat rails being stitched to prevent fraying for longer wearing.

The Model 172's 145-hp. Continental O-300-A 6-cylinder engine is the same as used in the 1958 model, one of which recently was flown to a new world's endurance record of 1,200 hrs. 16 mins. by Texas Pilots Bill Burkhart and Jim Heth. This engine gives the 172 a recommended cruising speed of 124 mph. At this speed, its 37.5-gal. fuel capacity gives 4.2 hrs. endurance. The 4-place Cessna has a 940-lb. useful load at a gross weight of 1,260 lbs.

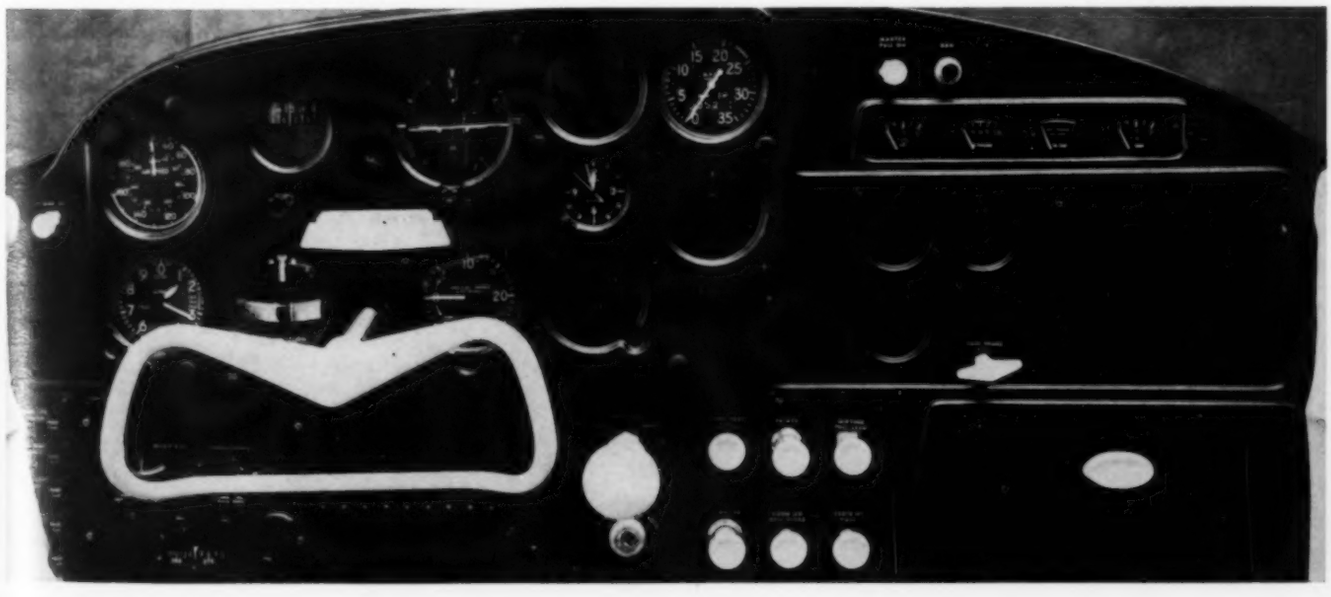
This is the fifth annual version of the 172 to be offered by Cessna, which introduced the tricycle-geared 172 in November, 1955, as a development from the tail-wheeled Model 170. Over 3,000 Model 172's have been delivered to customers in practically every country of the free world.

Factory data for the 172:

Price		$9,250
Top Spd., mph.		135
Cr. Perf. at 7,500 ft.—		
Mph.	Mi. Range	Hrs.
124	519	4.2
97	620	6.4
Fuel Cap., gals.		37.5
Rate of Climb, fpm.		660
Svc. Clng., ft.		13,300
Gr. Wt., lbs.		2,200
Empty Wt., lbs.		1,260
Useful Ld., lbs.		940
Bg. Cap., lbs.		120
Span-Width-Length-Height, ft.		36-25-8.5
Wing Area, sq. ft.		175
Wing Ldng., lbs. sq. ft.		12.6
Pow. Ldng., lbs. hp.		15.2

New Cessna 172 instrument panel has shock-mounted flight segment in front of pilot with engine instruments at right.

—(Cessna Aircraft Photo.)



Mooney Aircraft's 4-place Mark 20A, with 180-hp. Lycoming, will cruise 180 mph. Landing gear and flaps are manually operated.
—(Mooney Aircraft Photo.)

New Mooney Mark 20A For 1959

New trim distinguishes 1959 model from this year's Mark 20A (foreground).
—(Mooney Aircraft Photo.)

By GEORGE E. HADDAWAY

CONSTANT improvement of a good basic design is par for the course in the aviation manufacturing business these days when it comes to annual model changes. So it is with the basic Mooney model of 1959 — the Mark 20A with the 180-hp. Lycoming engine. The first deliveries of this sleek little four-placer will be a mass fly-a-way late in the month following the annual Mooney distributors' meeting November 22 at the factory in Kerrville, Texas. Price will be announced then. The 1958 price was $14,750.

It was our happy lot to fly the 1959 model late in October and find it just about everything the enthusiastic factory folks claim in the way of performance, economy and comfort.

The most notable innovation is a clever new retractable step which improves cabin entrance and exit a good thousand per cent. The step is lowered and raised by a simple recessed hand crank on the left side of the cabin beneath the pilot's side window. It carries its own fairing below the step and is completely mechanical. The new control wheels are an improvement as they are the side-grip airline type that give unrestricted instrument panel visibility.

Display mockup shows Mooney interior. Note coats hanging in baggage compartment of airplane (left). —(Mooney Aircraft Photos.)

Also new is a re-designed rudder pedal with toe brakes. This corrects the trouble on previous models of hitting the brakes unintentionally during ground steering. A more aesthetic paint design as shown in the accompanying illustrations and extra chrome on the flap and gear handles about complete the changes. Already phased into the basic design from the late '58 model were tinted glass, a new overhead ventilation system and a defroster system for the windshield. Thicker glass and improved upholstery have contributed to a quieter cabin. Nine pounds have been added to the empty weight, mostly from the handy little step. While Mooney traditionally shoots for high performance at low cost and not for luxury you certainly don't get any impression of any corners being cut on comfort or appointments.

So about the only sales resistance Mooney salesmen are having to buck is lack of cabin room. But when you sit down and take the actual cabin dimensions you find that this complaint is a bit illusory, probably because you sit so much closer to the instrument panel than in other airplanes. Two years ago we had a long distance non-stop flight in the first Mark 20 production job and we were quite comfortable for more than six hours. We do think the pedestal between the leg areas of the two front seats could be rounded off and perhaps made a bit smaller. But since they added more leg room in the back seats this is about the only basic cabin improvement left for the engineers to work on now that the overhead ventilation system has been installed.

The '59 Model we flew late last month had considerable extra equipment including a Mitchell autopilot, a complete IFR panel, a Mark II Narco Omnigator, a Lear ADF 12E radio compass, curtains, rotating beacon and auxiliary 14-gallon fuel tank. It was just about as complete a package as one could ask for in a single-engine airplane. With the two standard 17.5-gallon tanks and 14-gal. auxiliary supply, you get a good useable 49 gallons, or 6 hours economy cruise at 60% of power at 10,000 feet altitude.

In Flight

We imagine a Mooney owner eventually gets used to and takes for granted this kind of performance after a few months ownership but when you just fly one every now and then you come down respecting the design genius of Al Mooney, who always believed that an airplane was not much improvement over other forms of

(Continued on page 50)

Wide span of 35-ft. wing is emphasized in this portrait of Mark 20A with gear coming up. Mooney climbs 1,150 fpm. —(Mooney Aircraft Photo.)

Prototype for new Schweizer is 65-hp. single-seater but company may offer it as two-seater. Note wide span of 40-ft. sailplane wing. It tops 110 mph., cruises 100 mph. Wings are quickly removable for easy storage.

—(Schweizer Aircraft Photo.)

Schweizer 1-30 Kit Plane

A kit-plane development has been undertaken by Schweizer Aircraft Corporation and may well mark the beginning of a new era in private flying for those who want to try their hand at low-cost Sunday and week-end flying around the airport or farm pasture.

Schweizer is famous for its all-metal high-performance sailplanes and its Model 1-26 in kit form has been so successful that it has delivered about 75 of them. The company, located at Elmira, New York, has taken its first step in the powered airplane development by building a single-seat prototype, closely resembling the 1-26 sailplane but powered by a 65-hp. Continental engine. By early October it had been flown about 35 hours.

No decisions have yet been made for actual order-taking and production, but interest is high in the project, judging from inquiries the factory has received, and it would be possible to start deliveries in the summer of 1959. First, however, Schweizer has to decide whether to produce the kit plane as a single-seater or two-seater, or both. With no decisions having been made, the company avoids discussing pricing. But an idea can be gained from its experience with the 1-26 sailplane. It has been selling in kit form for $1,600; a fully-assembled 1-26 purchased ready to go at the factory in flyaway form costs $2,900 to $3,000. The powered plane, in kit form, probably would cost $2,000 to $2,500 disassembled — without engine and propeller.

The idea is that buyers would want to furnish their own engine and propeller — used 65-hp. engines, for example, are plentiful and inexpensive. Most purchasers probably would pre-

Powered 1-30's resemblance to famous Schweizer 1-26 sailplane is seen in this view showing high-aspect-ratio wing, Schweizer rudder and elevator. In kit form, 1-30 would be sold without engine and prop for about $2,500.

—(Schweizer Aircraft Photo.)

fer to buy the airplane in kit form, putting it together being part of the young buyer's process of getting into aviation. Clubs may be the principal buyers. There are a lot of unknowns in such marketing. That is one of the reasons Schweizer has not yet made any decisions about its powered-plane project.

One major feature of the Schweizer airplane, designated as the Model 1-30, is its easily removable wings. Almost identical to the wings on Schweizer's sailplanes, they are removable to facilitate easy storage and hauling behind an auto. However, the sailplane is carried on a trailer but the powered plane, with its wheeled landing gear, would be even more roadable with no trailer necessary — just fasten it to the rear of the car with the tail-wheel off the ground and tow it on its two main wheels, its wings fastened lengthwise to the fuselage. Its span thus would be only 90 inches, or less than 8 feet. For the weekend pilot, this would eliminate the hangar storage problem and its costs. It would also make it practical for the owner interested in aircraft mechanics to work on his airplane at home.

Performance-wise, the Schweizer is impressive with spectacular short-field capabilities. It is equipped with spoilers, just as is the famous Schweizer sailplane. Being motorless, sailplanes demand short-field characteristics because they frequently are landed in farm fields when lift from thermals plays out. Spoilers enable the pilot to do two things — (1) make extremely accurate spot landings and (2) kill lift in the landing flare-out to put the plane on the ground quickly and positively, eliminating long floating tendencies. With spoilers you don't drag it in low over the fence, risking a landing short of the field — you come in high and pop the spoilers for a 5-to-1 glide ratio to land short after the field is made.

What Schweizer is thinking about with the new plane is flying for fun and recreation. In a sailplane type of flying, the pilot does all of the flying, whereas in conventional powered airplanes the more abundant horsepower can make up for some piloting deficiencies. Gravity is the power for the sailplane and its performance is obtained through efficient aerodynamic design. The Schweizer 1-26 has a glide ratio of about 22 to 1, for example, and there are more expensive, usually hand-built, contest sailplanes having glide ratios of 40 to 1. In its powered airplane, Schweizer can not retain all of the 1-26's glide efficiency because of the landing gear, uncowled engine and propeller but it will still have a glide ratio of about 15 to 1 or better.

The powered 1-30's sailplane wing, 40 ft. in span, gives it more than 1,000 feet per minute for rate of climb. This is at 55 mph., which is way above its 38 mph. stall speed. It tops 110 mph. and will cruise a good 100 mph. It has a 13-gal. firewall fuel tank in front of the windshield. Its main landing gear appears to be similar to Cessna's but isn't, being an aluminum cantilever gear with rubber compression shock absorbers. The fuselage is a combination of monocoque metal structure in front with fabric covered steel tubing in the rear. Wing is all-metal and control surfaces are fabric covered.

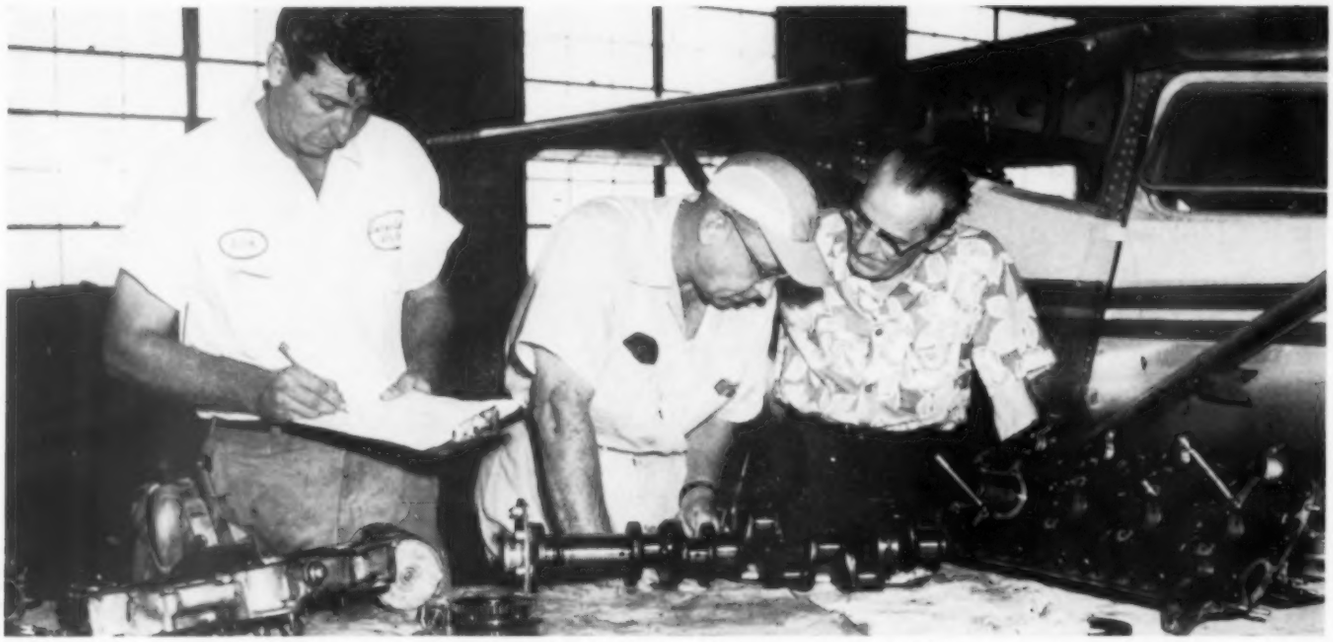
Lightweight, the 65-hp. 1-30 grosses only 1,100 lbs. and has a 400-lb. useful load with a 700-lb. empty weight. Although the prototype is a single-seater, it is being flown with 330 lbs. of additional load in ballast tanks and work has already started on a 2-place version.

As for short-field operations, the prototype takes off in 150 to 250 ft., according to the propeller used, and lands in 200 ft. This is in zero wind. It operates in and out over a 50-ft. obstacle and in zero wind within 360 to 480 ft. Thus it is seen that an airport is not a necessity for this airplane.

(Continued on page 51)

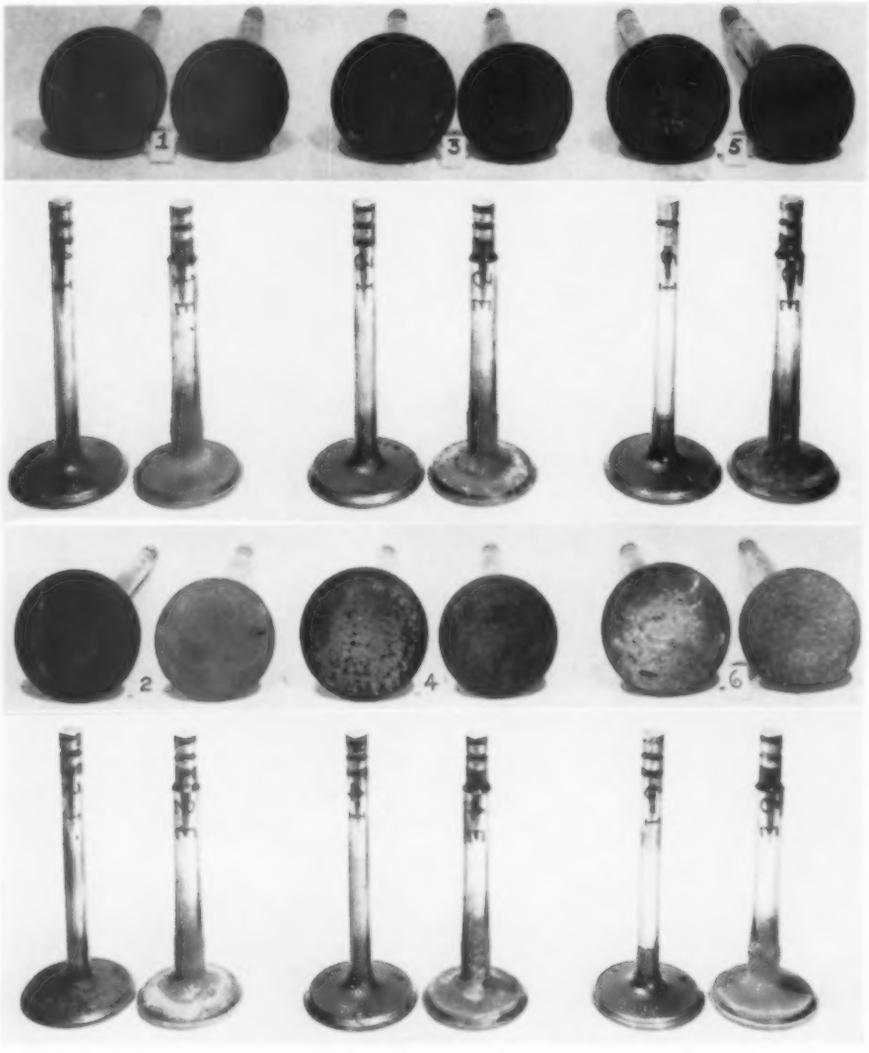
Beautiful lines of Schweizer kit plane are emphasized in this flight portrait. Wing has retractable sailplane spoilers for extreme accuracy in precision landings and short approaches. It can operate from unimproved fields, clearing 50-ft. obstacle in less than 500 ft. on take-off and landing.

—(Schweizer Aircraft Photo)



A & E Mechanic Bob Burk, CAA Agent Wayne Tuttle and Dr. S. I. Gleason, Wynn Oil Company research director, are pictured measuring and examining parts of the Continental engine which kept a Cessna 172 aloft 50 days for a new endurance record of 1,200 hrs. 16 mins.

Slight Engine Wear In 1,200-Hr. Record Hop



HOW an overhauled 145-hp. Continental Model O-300-A 6-cylinder engine, Serial No. 13330-D-7-A, withstood 1,200 hrs. and 16 mins. of continuous operation aloft is shown in photographs, measurements and laboratory tests made of its parts when it was disassembled last month following completion of a new 50-day endurance record for lightplanes by Dallas Pilots Bill Burkhart and Jim Heth. The engine powered a 4-place 1958 Cessna Model 172, which took off on August 2 and did not land until September 21. Pilots, airplane and engine were still functioning normally and the flight could have continued indefinitely.

In preparation for the flight, the engine was overhauled in June, having logged 220 hrs. of operation at that time. While it was disassembled, it was inspected and calipered by three technical experts — Dr. S. I. Gleason, research and development director for Wynn Oil Company of Azusa, California, which used the flight to test its Wynn's Friction Proofing for engines, transmissions and other machinery; Wayne Tuttle, CAA agent, and Bob Burk, A & E mechanic at Dallas-Gar-

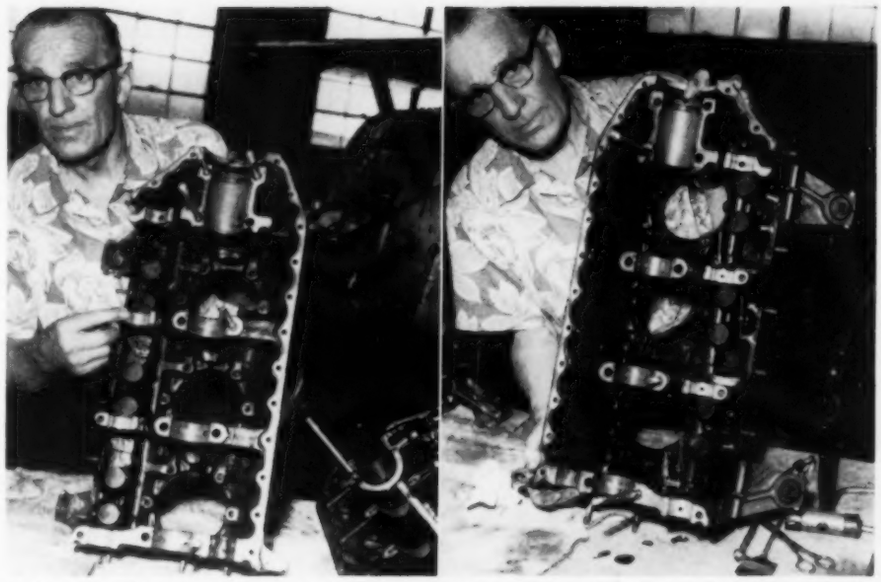
Intake and exhaust valves are shown at left. Note clean stems, minimum deposits and lack of seating wear.
—(Wynn Friction Proofing Photos.)

land Airport, who serviced the record flight. These same three technicians disassembled the engine at the conclusion of the flight, again measured its working parts.

Comparative before-and-after measurements show an almost unbelievable lack of engine wear and deterioration, as follows:

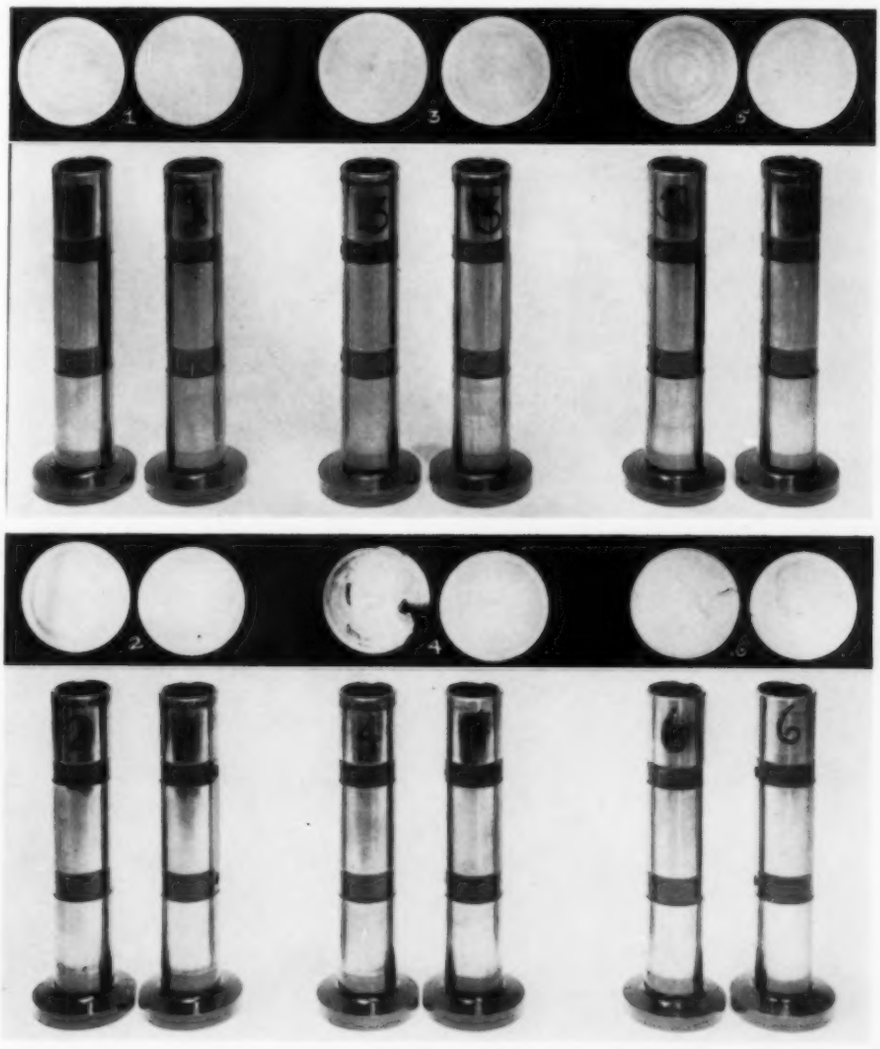
Before Flight In.	Before Flight Ex.		After 1,200 hrs. In.	After 1,200 hrs. Ex.
		Valve Guides		
.344	.437	No. 1	.3440	.4385
.344	.437	No. 2	.3445	.4380
.344	.437	No. 3	.3440	.4385
.344	.437	No. 4	.3440	.4380
.344	.437	No. 5	.3440	.4385
.344	.437	No. 6	.3440	.4380
		Valves		
.342	.433	No. 1	.3420	.4330
.342	.433	No. 2	.3420	.4330
.342	.433	No. 3	.3418	.4330
.342	.433	No. 4	.3415	.4325
.342	.433	No. 5	.3420	.4350
.342	.433	No. 6	.3420	.4330
		Cylinders		
4.0630		No. 1 Rear	4.0645	
4.0635		No. 2	4.0650	
4.0637		No. 3	4.0650	
4.0640		No. 4	4.0655	
4.0642		No. 5	4.0655	
4.0650		No. 6	4.0667	
		Crankshaft		
2.2475		No. 4 Rear Mn.	2.2470	
2.2480		No. 3	2.2480	
2.2480		No. 2	2.2470	
2.2475		No. 1	2,2470	
		Rod Bearings		
1.9375		No. 1 Rear	1.9375	
1.9370		No. 2	1.9375	
1.9370		No. 3	1.9370	
1.9380		No. 4	1.9375	
1.9380		No. 5	1.9375	
1.9375		No. 6	1.9370	

Cam followers and their barrels (right) show cleanness and absence of wear or scuffing. Slight stains on No. 4 and No. 6 sets are metallurgical markings, not from wear. Rocker arms below were not cleaned and show minimum wear.
—(Wynn Friction Proofing Photos.)

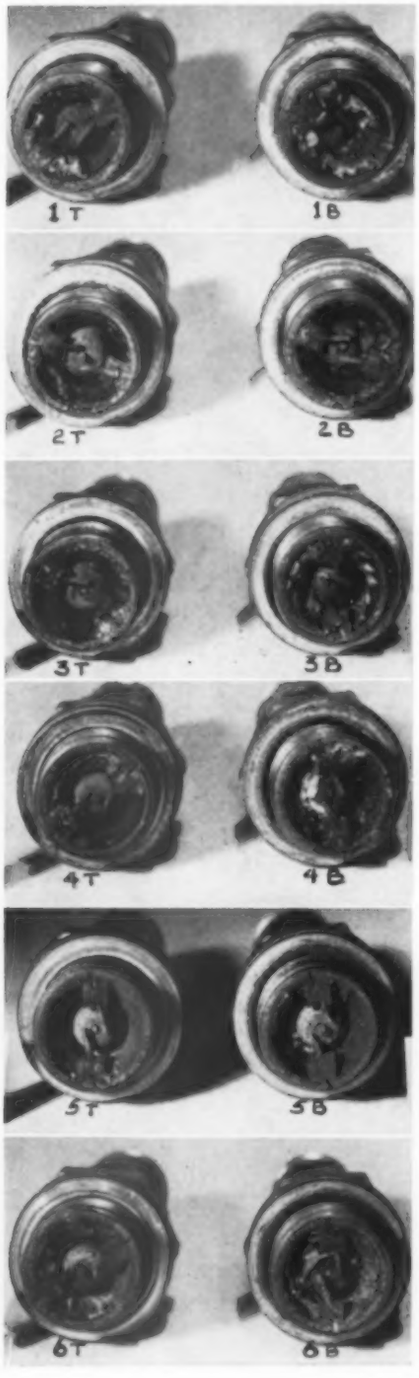


Inside of engine was clean, without the usual heavy deposits of sludge. The mechanic said this engine was cleaner after 1,200 hrs. than when it was disassembled after its first 200 hrs.
—(Wynn Friction Proofing Photos.)

The engine actually had logged over 1,200 hrs. of operation. Before it was overhauled prior to the flight, it had logged 220 hrs. In the overhaul, new parts were installed as follows: Cam shaft, four valve lifters, six pistons and all rings, all bearings, cam shaft driving gear and the gear for the cam shaft, six intake valves, six exhaust valves, two new magnetos and pump



Partially collapsed oil screen continued to function. Residue is not unusual in view of operating 1,200 hrs. without filter change.



housing. On completion of the pre-flight overhaul, CAA Agent Tuttle sealed the engine, affixing the seals in numerous places on the engine, including the propeller. The airplane and engine were then operated a total of 80 hours in preliminary tests to determine pick-up methods for refueling and resupplying the flight from a pick-up truck, and methods for adding and changing oil in flight. In other words, at the conclusion of the 1,200 hrs. and 16 mins. of continuous and uninterrupted flight for the new endurance record, the engine had actually operated 1,500 hrs. and 16 mins.

During the first 600 hrs. of the endurance flight, the oil was not changed but one quart was added every 12 hours. A kink in the hose connections between a cockpit sight gauge and the engine had created an air block, preventing the gauge from indicating accurately during the first 600 hrs. The pilots became aware of the trouble at that point, bled the air and from then on obtained satisfactory readings so that oil changes could be made. The process was to drain four quarts and add four quarts, repeating this three times every 24 hrs. This renewed about 90% of the crankcase oil every day. Oil consumption during the last 600 hrs. of flight averaged three quarts every 24 hrs.

Fuel consumption averaged 6.5 gals. hourly, the engine being operated at 2,200 rpm. Refueling and provisioning of the flight was performed with the use of a rope grab, flying low along a runway and above a speeding pick-up truck from which a ground crew affixed to the rope 2-gal. plastic bottles of fuel and containers of oil, food and other provisions. Each refueling required 17 passes over the truck. This was performed each morning and each afternoon, so that at the end of 50 days a total of 1,700 passes had been made with the pick-up truck.

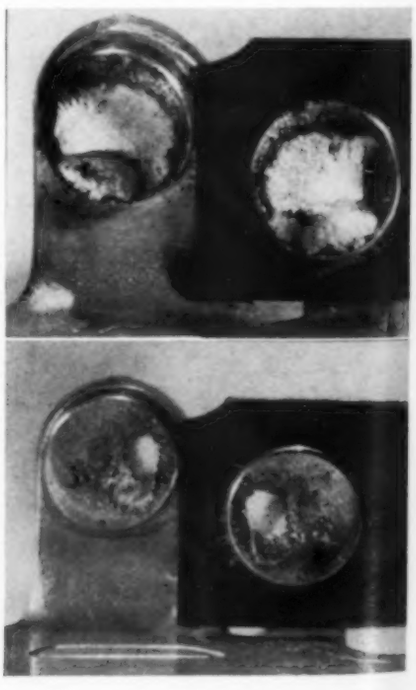
BG spark plugs after 1,200 hrs. contained varying combustion deposits, chiefly of fuel lead, and electrodes were in varying condition but all were operating normally. Note minimum deposits on pistons (below) and condition of points (right).
—(Wynn Friction Proofing Photos.)

Cam shaft on the left was discarded when engine was disassembled after 200 hrs. before the flight. Cam shaft at right, operated throughout the flight, showed less wear.

Because the flight was used as a test for Wynn's products, careful control was exercised over pre-mixing of the compound with oil and fuel. The formula was to add the material to the engine oil at a rate of 2% by volume and to the fuel at a rate of 0.15%. Name of the material added to the oil is "Wynn's Friction Proofing Heavy Duty for Aircraft Engines" and for the fuel "Wynn's Friction Proofing Fuel Conditioner."

Gulf SAE 40 non-detergent oil and Gulf aviation gasoline were used, ex-

(Continued on page 50)



The Boeing 707 jet airliner towers over Shell's jet fuel truck.

AeroShell Turbine Fuels for the Jet Age

The Boeing 707—America's first jet airliner scheduled for passenger service is ushering in the commercial Jet Age.

Ready to serve these new jets wherever they fly are AeroShell Turbine Fuels developed especially by Shell to meet the exacting requirements of this new Jet Age. Shell, largest supplier of commercial jet fuel and aviation gasoline in the U.S.A. guards fuel quality by special handling techniques developed in Shell's unique AeroShell Turbine Fuel Equipment Laboratory.

WRITE FOR FREE LEAFLET

"FUELING THE BOEING 707"

This step-by-step picture story shows how single-point fueling works.

SHELL OIL COMPANY

50 WEST 50th STREET, NEW YORK 20, N. Y.
100 BUSH STREET, SAN FRANCISCO 6, CALIF.

SHELL

Although it looks like any other corporate DC-3 with Maximizer and landing gear doors, Mene Grande Oil's YV-P-AEK in Venezuela contains many innovations including wing bays containing baggage and all radio gear, radar-autopilot console from which it can be controlled in weather penetrations and special long-range fuel, crew and passenger provisions. Lower photo shows engine-out take-off using supplementary thrust from dual flush-mounted Jato rockets (note flame).

—(Executive Aircraft Service Photos.)

Best Equipped DC-3 Flying

AS corporate-owned Douglas DC-3's go, the most completely-equipped modernized Douglas in the air is being flown by Mene Grande Oil Company of Venezuela, a Gulf Oil subsidiary. It incorporates practically all of the latest developments both in DC-3 conversions and in equipment.

This Douglas culminates years of planning by Vernelle (Red) Irwin, now with Gulf, while he directed Mene Grande aviation operations in South America. Its improvements not only fit the specialized transportation needs of Mene Grande but represent years of conversion refinements as developed by Executive Aircraft Service of Dallas, which specializes in DC-3 and Lodestar improvements and has turned out about 150 corporate versions of those transports. Its radio-electronic equipment installations for navigation and communications are the ultimate as perfected by Associated Radio of Dallas, which has engineered custom installations in hundreds of corporate transports down through the years.

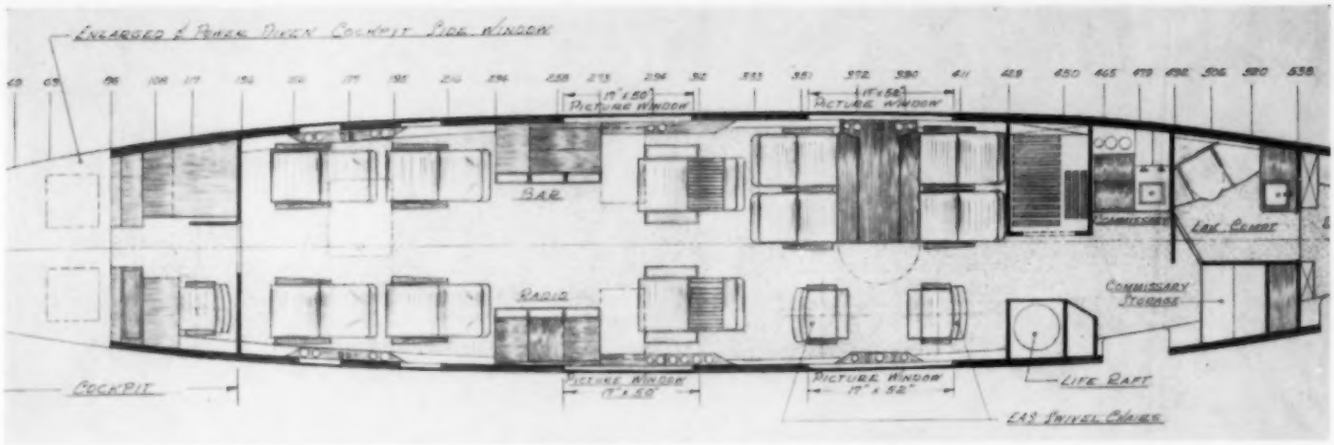
Baggage and Radio in Wings

The Mene Grande DC-3, licensed in Venezuela as YV-P-AEK, is especially distinctive because of its extensive cockpit and wing modifications. All wing center-section fuel tanks were removed and all fuel is carried by integral tanks in the outer wing panels. This enabled Executive Aircraft to convert the voluminous center-section interior into four large equipment and baggage bays, in which all of the aircraft's radio was installed. Removal of this large amount of equipment from the cabin made room for considerable free space for the cockpit, which was lengthened rearward to provide a third crew station with comfortable track-mounted swivel chair, console for radar, autopilot controls, electrical panels and controls, crew library and other facilities, including a small crew galley.

Hydraulic Cockpit Windows

Track-mounted long-range crew chairs are used for maximum comfort required for long-range operations. This airplane has a total fuel capacity of 1,180 gals. for up to 11 hrs. of duration. Enlargement of the cockpit also made possible longer cockpit side windows. These are not only picture-window type but they contain hydraulically-operated glass panels, an innovation.

The Mene Grande DC-3 is equipped with P & W R-1830-94 engines, rated at 1,350 hp. for take-off and 1,100 hp. METO. The airplane is also



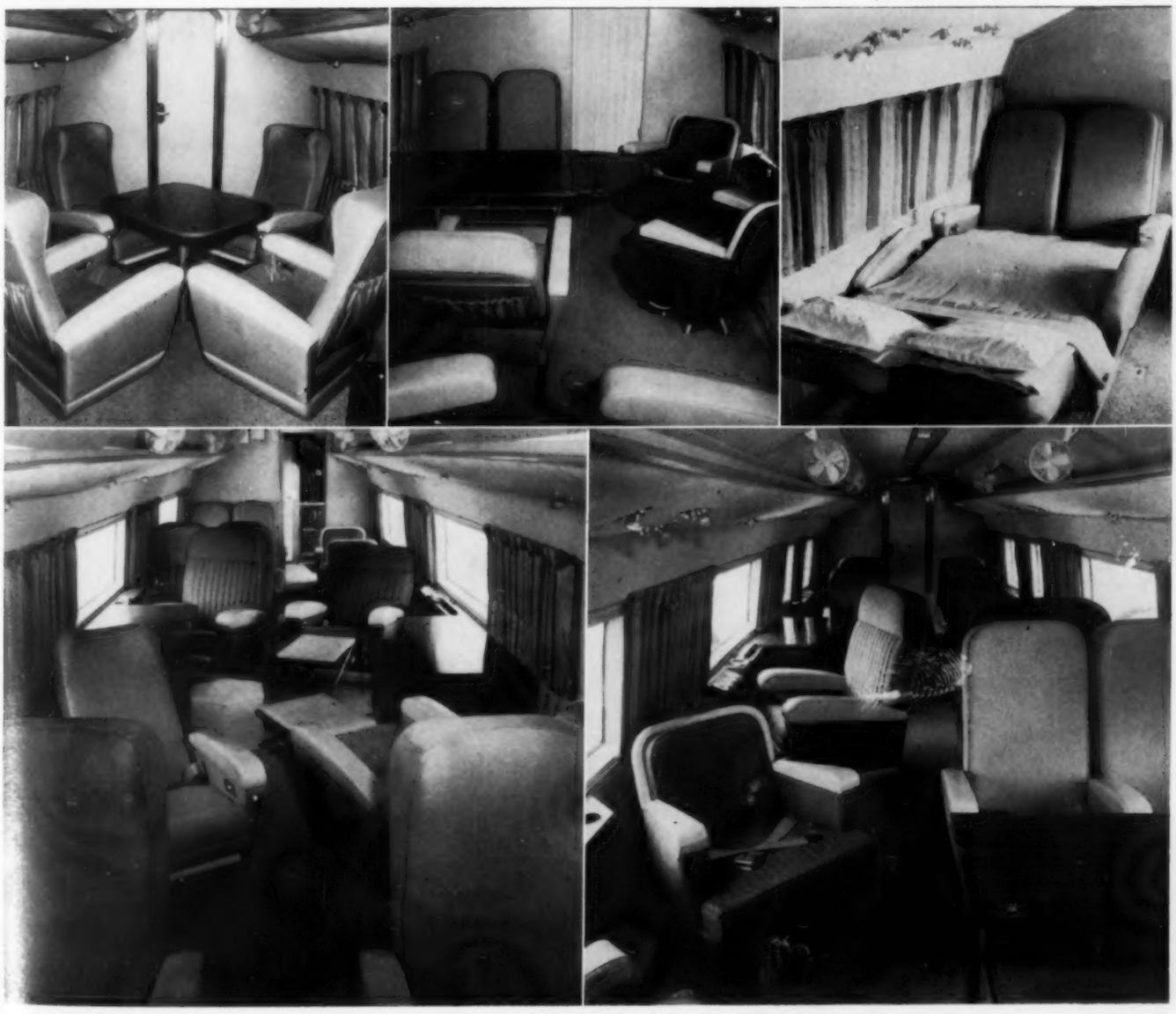
Floor plan shows lengthened cockpit (left), spacious cabin seating and large rear compartments.

equipped with the complete Maximizer kit plus squared wing tips. Flush-mounted dual Jato rocket engines were installed.

At 26,900-lb. gross weight, it has a 1,400-fpm. take-off rate of climb and was cruised at 180-mph. indicated air speed at 10,000 ft. using 2,150 rpm. and 31 ins. with outside air temperature of 2 degs. C. This test was over a measured triangular course of 482 miles, true air speed and ground speed averaging out 214 mph. for the three-sided course.

The cabin seats 12 passengers, all in chairs. Four of these are berthable, arranged so that they will sleep two persons in bed-like comfort. Four

Cabin views show variety of large, utilitarian chairs in cabin. Note sleeping provisions, table groupings and cabinets used as cabin dividers (lower left.) —(Executive Aircraft Service Photos.)



Large access doors under wing center section lead to two radio compartments and two baggage compartments. All fuel is carried in outer wing tanks, capacity being 1,180 gals.

Four views of area behind cockpit, showing console with radar scope and controls, autopilot controls, flight instruments. Behind pilot, it also contains electrical services and circuit-breaker panel. Behind co-pilot is lowered hydraulic panel with flap and gear handles. Aft of it is Jeppesen library, work table and crew galley.

Cockpit view shows large power-driven cockpit windows, one-piece bird-resistant windshields, custom instrument, radio and switch panels, track-mounted and adjustable pilot chairs. —(Executive Aircraft Service Photos.)

large picture windows open up the cabin for maximum lighting, two of them 52 ins. long and two 50 ins. long. Equipped for maximum comfort, the cabin is business-like, however, and devoid of non-useful frills. At the rear are spacious compartments for coats, commissary, commissary storage, lavatory and baggage and a special compartment containing an emergency life raft for the airplane's frequent over-water trips.

Extensive Equipment

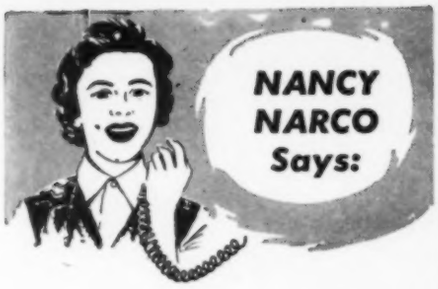
Equipment includes dual installations of the latest Collins airline-type communications and navigation radio, Collins AP-101 autopilot system and integrated flight system, with remote controls at the third crew position, where a large scope and controls for the RCA AVQ-10 radar are installed: dual ARC ADF-21's, a Collins 618-S high-frequency transceiver for use in foreign areas, Sperry C4 Gyrosyn compass; 200-amp. generator system, Edison fire detector system with CO-2 fire extinguishing system, new-type electric fuel flowmeters, rear-mounted Janitrol heater installation with Barber-Colman automatic temperature controls, large-capacity ground blower system, cockpit air system, one-piece bird-resistant windshields and many other refinements.

YV-P-AEK's complete Maximizer installation includes exhaust system and exhaust trough, cowling modification kit, aileron gap closure kit, main landing gear wheel doors, oil cooler fairing kit, and tail wheel fairing. In addition to these, other special installations include Pan American squared wing tips, Executive Aircraft Service geared rudder servo tab, Super-3 wheel and brakes, side-mounted pitot tubes and outer-panel fuel cells.

Chairs in the airplane include 8 Burns Aero chairs, of which 6 are singles and 2 doubles, and 2 Warren McArthur chairs in the cabin and three Warren McArthur chairs in the cockpit, all track-mounted and the third-crew chair at the cockpit console being a swivel chair.

The installation of flush-mounted dual Jato rocket engines for supplementary thrust was called for because this airplane operates frequently from high elevation fields in the tropics where standby thrust would prove valuable in possible engine-out emergencies. The two Jatos are installed internally for minimum-drag flush mounting.

Executive Aircraft Service and Associated Radio describe the Mene Grande airplane as the most modern and most completely-equipped DC-3 they have ever delivered.



TROUBLE MAKING CONTACT?

Lotta people get discouraged or downright mad at their transmitters because sometimes they can't get anyone to answer even though they're practically looking at the radio station.

First thing to bear in mind is that many new Omnis going in now are marked "W" on the chart which means "No Voice." They've been installed primarily as en route radio navigation aids and it just costs too much money to station real live communicators in each and every one of those round buildings down there.

You can also have trouble with Omnis that *can* talk back at you if you forget considerations of terrain and altitude. Many of the talking Omnis are remotely located and are operated by a crew at a CAA Air Traffic Communications Station some miles away.

A classic case is the Selinsgrove, Pa. Omni located on busy Victor 6 between Newark and Cleveland. If you're below 5,000 feet, even though you're right over Selinsgrove you can't talk to SEG because your transmission has to go 32 miles to be picked up at Williamsport, Pa. and Williamsport, unfortunately, lies right beyond a 2,000 foot ridge. Of course, it isn't too often you run into a situation like this, but it's good to know about it.

There are other situations where they've gone all-out to assure satisfactory communications. For instance, transmitters as well as receiving antennas for many frequencies used by Air Traffic Control Centers are "remoted" — located 100 miles or more out from the center itself, and connected to the center by land lines.

When the first remote stations were installed, a couple of airline captains pretty near lost their hearing. They'd call the center at maximum range, turn their volume up real good expecting at best a weak signal. Wham! A newly installed remote transmitter close by would just about knock the ear phones off. (Maybe that's why Cap'n Sharp wears a hearing aid!)

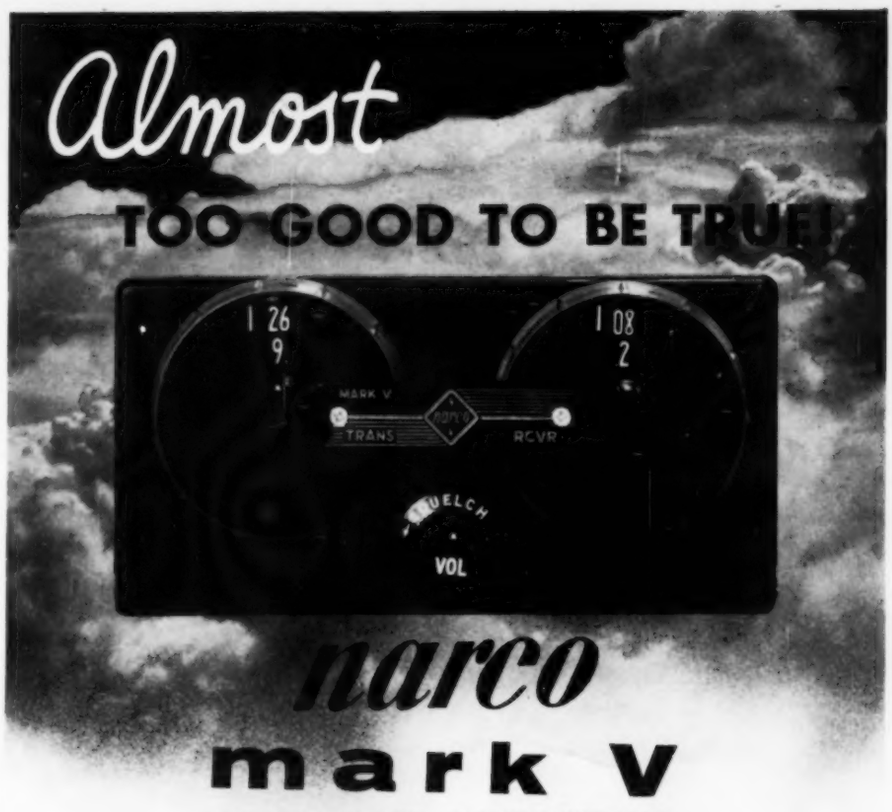
I ran into an interesting remote set-up on the Island of Martha's Vineyard off the coast of Massachusetts a couple of weeks ago. Wanted to file night IFR before takeoff and the nearest ATCS was Nantucket CAA 30 miles away. No problem contacting them. Just called on 122.1, listened 122.3 — they had a receiver and antenna sitting right on the hangar roof at Martha's Vineyard and connected by telephone cable to Nantucket. Real handy!

See you next month.

Best regards,

Nancy

NARCO • Fort Washington, Pa.



narco mark V

90-CHANNEL TRANSMITTER
190-CHANNEL RECEIVER

Crystal-Controlled! for only $998

Here's the biggest news in aircraft communications ever! Narco proudly announces the new Narco Mark V, an all-channel VHF transmitter and receiver with 90 crystal-controlled transmitting frequencies—*every channel in use between 118 and 126.9 mc*—and a 190-channel crystal-controlled receiver—*every channel in use between 108 and 126.9 mc!*

Never before has such an all-channel, all-purpose unit with airline-type crystal tuning been offered at anywhere near the price of the Mark V. Don't buy any VHF communications equipment until you've seen and worked this sensational unit—another addition to Narco's famous line of dependable, reliable aircraft radios.

You'll like these features of the Mk V

CROSS-CHANNEL OPERATION. Separate transmitter and receiver selectors give you complete flexibility of operation—simplex, double-channel simplex, cross-channel.

VOR/ILS NAVIGATION. Crystal-tune *quickly, positively* any VOR or ILS localizer frequency. Narco VOA-3 Omni converter with panel-mounted indicator can be used with Mark V to provide complete VOR/ILS navigation system.

EXTRA LARGE NUMBERS permit easy-to-read frequency selection. Perfectly back-lighted for night-time use.

VARIABLE SQUELCH. Tunes out distant stations, extraneous noise. Provides crystal-clear reception.

TRANSISTOR-TOROID POWER SUPPLY adds to dependability, saves weight, reduces power drain.

FIVE WATT TRANSMITTER gives you good, dependable long-range transmission every time.

COMPACT, LIGHTWEIGHT. Only 3" high, 6⅜" wide, 12" deep, weighs less than 10 pounds, complete with separate power supply.

See the Mark V at your Narco dealer's or write for brochure.

narco
NATIONAL AERONAUTICAL CORP., FORT WASHINGTON, PA.

Owners of private planes are organizing all over the country to operate local March of Dimes Airlifts during January, giving public rides at $2 for adults and $1 for children with all proceeds going to the March of Dimes.

Airlifts Help March Of Dimes

BUSINESS fliers and their airplanes will participate in March of Dimes Airlifts all over the United States in January, thanks to an idea originated two years ago at Grand Rapids, Michigan, by William A. Duthler, president of the Kent County Pilots Association. Its success spread to adjacent areas last year and will become nationwide in January.

Here's the way it operates: Private planes are pooled to offer the public airplane rides at $2 per adult and $1 per child. All proceeds go to the March of Dimes for its expanded attack against disease and crippling among children. Riders get their money's worth not only from helping to finance March of Dimes projects but from enjoying a flight aloft and a chance to view their local community from the air. Aviation benefits because many of the riders will be making their first flight.

"The March of Dimes Airlift has stimulated tremendous public interest in flying wherever it has been held," says the originator, Mr. Duthler. "It has created goodwill for local airports, caught the imagination of local news

W. A. Duthler (left) of Grand Rapids, Mich., originated Dimes Airlift. Airlines also operate local airlifts (below).

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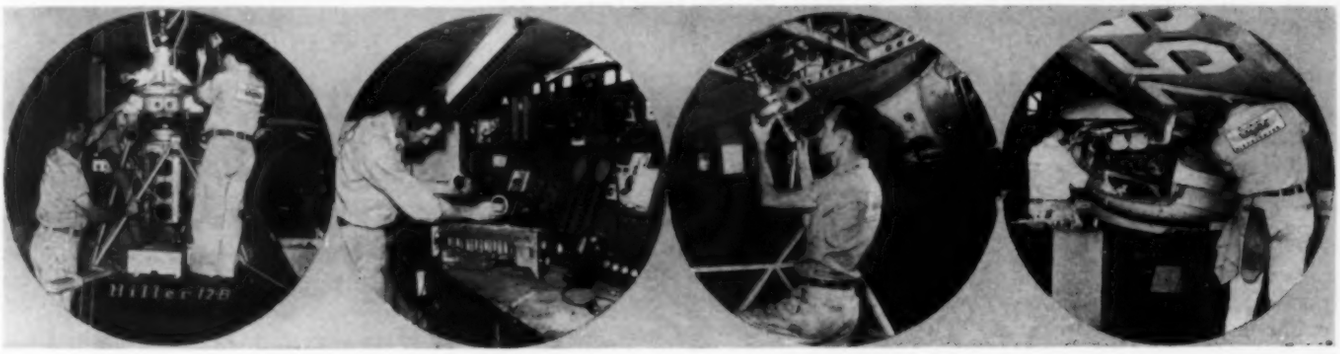

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Helicopters, too, are used for short hops with proceeds going to March of Dimes for children disabled by birth defects, arthritis and virus disease.

media and raised many thousands of dollars for the organization which was so successful in the polio fight that it is now waging the same kind of war against arthritis and birth defects."

He said the Airlift has had very enthusiastic support from local airports, gasoline companies and organizations such as pilots associations, Jaycees, auxiliary police, Civil Air Patrol and other civic-minded organizations. "We show them our very simple plan of action and they are quick to grasp the opportunity to perform a vital public service," Duthler said. "The CAA has joined in with special permission for private pilots to carry passengers for this event — the CAA does not require that pilots have a commercial license to carry passengers for pay when all the proceeds go to a charitable organization. We've raised as much as $1,800 at a single airport. With more experience and better organization in January, we'll more than double our contributions to the crippled children of the country."

March of Dimes headquarters in New York reports equally enthusiastic reports of growing success with the Airlift in other parts of the country. Airplane rides raised $1,200 in a single day last January at Augusta, Georgia, using planes donated by the Augusta School of Aviation and a local distributor furnishing gasoline. At Albuquerque, Frontier Airlines ran the whole operation and sent $1,250 to the March of Dimes in just six hours. Helicopters, corporation airplanes, transports — just about everything with wings — are getting people into the air who never before had the opportunity to fly and they are helping thousands who might never have the opportunity to walk without the March of Dimes.

Duthler's tips for pilots, associations or civic groups who may be interested in operating a March of Dimes Airlift during the forthcoming January campaign include the following:

"There's a volunteer March of Dimes county campaign director in every county of the United States," he said. "He will be glad to call a meeting of plane owners and private pilots, airport managers and others who will have a part in the operation. Together, you set a January date for the event, preferably a Saturday, with a postponement date in case of bad weather. We have found it awkward to use more than 12 airplanes at a time because of the delay in loading and waiting to take-off and land. If you have more than a dozen airplanes, plan the event for two days. You can contact a local gasoline distributor for contribution of fuel, or go to the Retail Gasoline Association in your area for help.

"Blanket insurance coverage for the operation can be obtained for a very reasonable figure. We received an excellent liability policy for our Michigan operation at a cost of only $6.40 per day for each 4-place airplane. Four-place or larger airplanes are best for this purpose, because most people come out with the family or friends, and they want to be together. Larger planes also help in keeping the traffic

Airplane below was one operated at Augusta, Georgia, which raised $1,200 in a single day for the March of Dimes. Poster shown is one for 1959 campaign.

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To obtain the best service for your Beechcraft and for prompt attention to maintenance and overhaul requirements, visit the Certified Beechcraft Service Stations listed.

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- Logan International Airport
  East Boston, Massachusetts
- International Airport
  Philadelphia, Pennsylvania
- New Castle County Airport
  Wilmington, Delaware

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CURREY SANDERS AIRCRAFT CO., INC.
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PLANESERVICE, INC. (Service Division)
Van Nuys Airport, Van Nuys, Calif.
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J. D. REED CO., INC.
Municipal Airport, Houston, Texas

ROSCOE TURNER AERONAUTICAL CORP.
Municipal Airport, Indianapolis, Ind.

TEXAS AVIATION CORPORATION
G. K. Roberts, Pounds Field
Tyler, Texas

TOPEKA AIRCRAFT SALES & SERVICE
Municipal Airport, Topeka, Kansas

TRADEWIND AIRPORT CORP.
Tradewind Airport, Amarillo, Texas

TULSAIR DISTRIBUTORS, INC.
Hangar 8, Municipal Airport, Tulsa, Oklahoma

UNITED AIRPLANE SALES, INC.
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Wichita, Kansas

Put Your BEECHCRAFT in BEECHCRAFT Hands

moving, because there are fewer loading problems. We've been quite successful in getting corporations to donate their twin-engine airplanes and pilots as a goodwill gesture.

"In very cold weather, have a hangar area available for waiting passengers. Your loading points should be guarded by Civil Air Patrol personnel or auxiliary police. If you make sure that all passengers are escorted to the planes and assisted in boarding, it will be possible to load and unload the multi-engine planes without shutting off the motors.

"Before the big day, meet with your CAA authorities and airport personnel to map out a route of flight, so that all planes will be flying the same route, with take-offs and landings at approximately two-minute intervals. It will cut traffic hazards and keep your ulcers quiet.

"Don't forget that the success of the March of Dimes Airlift program depends upon heavy advance publicity. If you want to get people out to the airport, you have to let them know what's going on and when it's going to happen. Newspaper stories and photos, radio announcements and even a fly-over of planes dropping leaflet announcements, will assure you of a big turn-out when you're ready to get your Airlift off the ground. You'll have a lot of fun and you'll be doing a lot to protect your own kids and help crippled children all over the nation.

TRANS-PACIFIC TRAVEL AIR was flown by Jack Ford (above) of Skyways Aircraft Ferrying Service, Van Nuys, Calif., from San Francisco 2,395 mi. to Honolulu, 2,300 mi. to Wake Island, 1,485 mi. to Guam and 1,593 mi. to Manila for delivery from the Beech factory. He carried total of 300 gals of fuel.
—(Beech Aircraft Photo.)

"The March of Dimes takes place January 2-31, 1959. Give it a lift with a March of Dimes Airlift in your community."

NEW PIPER APACHE

(Continued from page 29)

pletely covers all stringers and other members around the cabin, eliminating gaps in earlier models where soundproofing was concentrated in the bays between areas. As a result of these accomplishments, Apache exhaust on the outside has been quieted with the sound-absorption liners in the exhaust tubes and interior cabin quietness is noticeably improved by the thicker glass and more extensive soundproofing.

A completely revised instrument panel locates all flight instruments on the left directly in front of the pilot, places all radio controls in the center for more convenient tuning and reference from both front seats, and locates engine and auxiliary instruments on the right side. The new arrangement offers additional space for extra instruments, providing 14 large 3-in. instrument cutouts instead of 12 previously and 7 smaller instrument holes instead of 5 previously. At the same time, additional space has been provided between the left control wheel and the throttle quadrant for convenient installation of an automatic pilot control head. On the right side, a glove compartment has been added in addition to a large map drawer underneath. Additional radio can be installed in the glove compartment.

The 1959 Apache features a revised exterior paint scheme with four different standard color combinations offered. They are Daytona white wings and fuselage with Santa Fe red, Bahama blue, Montego green or Hershey brown trim. Optional equipment includes a fifth passenger seat for installation behind the standard rear seat in the baggage area.

Ducted-Fan Aerial Jeep Makes First Flight

A wingless research vehicle, Piasecki Aircraft Corporation's Army VZ-8P, is pictured below making its first flight at Philadelphia last month. Two horizontal rotor propellers, one in front of the pilot and one behind him, are shielded by ducts and variable vanes and provide thrust for vertical and forward flight. The designer reported "very positive control in every direction was achieved throughout the first flight." Its low and wingless design enables it to fly under wires and bridges and close to trees or other obstacles. Piasecki says it has started CAA certification procedures for a commercial "Sky Car" version to carry 4 persons at speeds up to 150 mph.
—(Piasecki Aircraft Photo.)

Large enough to be able to SERVE you . . .

Small enough to know how to SERVE you

MEET ONE OF OUR NEW CUSTOMERS — Bill Behel, of Lake Tahoe Airline, who recently stopped with us for correction of engine trouble in the Sea Bee he was ferrying from Cape Cod, Mass., to Sausalito, Calif. Mr. Behel remarked, "I have never experienced such courteous service or witnessed a display of so many modern executive aircraft at one operation."

Naturally, we are proud of the fact that SOUTHWEST AIRCRAFT, Inc., has grown into one of the nation's largest fixed base operations with over 2 acres of modern hangars and shops — staffed and equipped — to provide the best service available.

But, big as we are, little things count . . . IN A BIG WAY . . . when you bring your aircraft to us for service and maintenance. Every detail is given specialized attention — the kind of attention that assures efficient performance of your aircraft.

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- ★ No Tie Down Fee
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10 Minutes to Downtown Fort Worth
45 Minutes to Downtown Dallas

ROY R. TAYLOR
President

ENGINE ANALYSIS

(Continued from page 38)

cept for small amounts of other brands when weather conditions forced refueling at points where Gulf was unavailable. In all cases, however, the Wynn material was carefully pre-mixed with the oil and gas.

Post-flight engine teardown and analysis showed this control over and additive-treatment of oil and fuel kept the engine parts exceptionally clean and efficient throughout the long flight. All of the plugs and points were functioning normally in a magneto check just before landing and after landing a compression check showed five cylinders operating at 140 and the sixth cylinder at 150. The maximum amount of wear on the cylinders was only 1.5 thousandths of the diameter. All piston rings were operating normally and freely. The crankcase was totally free from sludge or extraordinary deposits. Valves were described as being clean and in excellent condition, as were cam followers, their barrels, cam shaft, valve lifters, springs and rocker arms. Mechanical parts of the magnetos and pumps were found to be unusually clean and showing little if any wear.

All of the crankshaft bearings were described as being in "perfect" condition, and rod bearings showed only slight evidence of wear.

Combustion deposits on piston heads and valves were described as less than had been expected. Some of the spark plugs were extensively leaded, with the center electrode almost entirely eroded away, but none had faltered and all were firing when the flight landed. Distributor points were funtioning without a miss although they showed normal wear when removed. The oil screens contained less foreign matter than had been expected and much of this matter was found to be dirt and sand picked up during the 1,700 refueling passes close to the runway. The fuel filter was found to contain a considerable amount of plastic but cottony "fuzz" from the plastic bottles used in refueling.

The engine was cleaner and showed less wear deterioration at the end of the 1,200-hr. continuous flight than the average engine of the same make and model shows after 800 hrs. of ordinary operation, which is the authorized overhaul period for the engine. Being cleaner inside and with efficient lubrication, it operated with less heat and less wear than normal. It was agreed that the engine could have operated somewhat longer until the plugs or points ceased funtioning and that, with new plugs and points, it could have operated indefinitely.

Wynn Oil Company says it has now received CAA approval for its material in aircraft, the official wording of the approval being as follows: "Wynn's Friction Proofing Heavy Duty for Aircraft Engines and Wynn's Friction Proofing Aviation Fuel Conditioner have been approved by the CAA for use in engines of not more than 260 hp." The company plans to market the material throughout the aviation industry. Its product is described as being a chemical formula which causes a beneficial chemical reaction in oil and fuel.

MOONEY MARK 20A

(Continued from page 33)

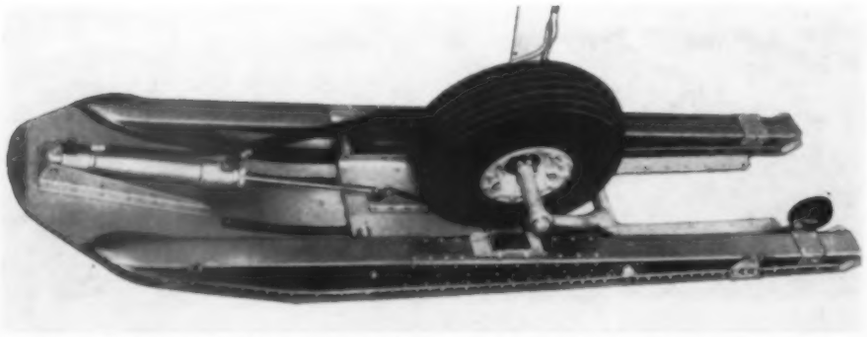
transportation unless it provided high speed at the lowest possible cost. Al's theory has been perpetuated by his successors at Mooney Aircraft, Inc., who are on a one-per-day production schedule, currently back-ordered and well into the profit column after years of struggle with important developments coming along.

Whether you are in the market for a new airplane or simply like to keep up with the lightplane business and really have an appreciation for engineering progress, go look up a Mooney dealer and get a demonstration. Get the full stall treatment because stall characteristics of the Mooney are just as impressive as its performance capabilities. We started out at 5,000 feet in good stable air, hauled back on the wheel and gained a thousand feet while the air speed indicator dropped to 50 miles per hour, at which point the stall warning indicator started buzzing. You keep the back pressure on with mild buffeting to an IAS of 40 miles per hour and hold it nose up with good positive aileron control. A slight release of back pressure and the buffeting stops immediately as flying speed picks up. The most impressive demonstration is to stall the Mark 20 in a turn and keep it there all around the 360-degrees with the same stability as in a straight stall. Some people seem to have the idea that Mooney's laminar flow wing and the over-all cleanliness of the design would produce bad stall characteristics. The opposite is true as in the case of most modern airplanes that are most forgiving and provide all the warning in the world to the neophyte who is rightfully taught to have an ingrained fear of the stall.

With a 15-to-1 glide ratio, the Mark 20 is delightful to play with at altitude, dead stick. Pilots have been known to fly it like a glider in strong thermal conditions, without power. The power-off stalls were even more impressive than those with power on. At seven thousand feet we established an indicated air speed in the glide of 80 mph. power off and settled down at 600 feet per minute with our choice of three airports and a jillion other pastures to get into.

We had a chance to work the computer at various altitudes from five to ten thousand feet. Usual cruise below 7,000 ft. is 2,300 rpm. at 23 inches for about 67 per cent power for 160-mph. indicated. Economy cruise is at 10,000 feet pulling 20 inches of mercury at 2,200 rpm., at which 142 mph. is indicated and this trued out for us at 165. You pull the propeller back into high pitch, lean out for maximum increase in rpm., then increase the prop setting to 2,200 rpm. Gas consumption figures about 7.75 gallons per hour at this setting. So the factory boast of six hours range is completely justifiable with the 14-gallon auxiliary tank.

Mooney doesn't talk much about the new stuff coming along. Like all manufacturers they want to sell the current model until they can give firm delivery dates on anything new. Most readers have seen photos of the twin



TIRE-CUSHIONED LANDING GEAR SKI FOR LIGHTPLANES, marketed by Fli-Lite Corp., Roseau, Minnesota, is equipped with low-pressure hydraulic system having either manual or motor driven power pack. Cockpit control enables pilot to operate from either wheels or skis. It attaches to gear in manner which fully utilizes the tire to absorb ground shock loads during ski operation.

under development and our spies tell us they have a Mark 20 with more power. Both of these prototypes have the same cabin and type of construction as the Mark 20. Whatever they come up with out of Kerrville you can be sure its going to be high performance and the lowest possible cost. This is very, very healthy for the lightplane business.

SCHWEIZER KIT PLANE

(Continued from page 35)

Farm patches will do.

The kit's the thing for the 1-30, Schweizer believes.

"There is an active movement of persons building their own sport plane, as evidenced by the rapid growth of the Experimental Aircraft Association," Schweizer says. "Most of these people are building types which are not ATC'ed. It is felt there are many people who like to work on such projects but yet who wish the assurance of reliable structure and flight performance as guaranteed by an Approved Type Certificate. The kit plane has worked out very well in sailplanes.

"The ability to land in small, unprepared fields is one of the natural abilities of gliders and sailplanes. Through efficient wings and stable, slow flying characteristics, together with the use of sailplane-type spoilers, much better small-field landing characteristics can be given to airplanes. In addition, the rugged design necessitated by sailplane operation has many advantages when transposed to airplane design. When the flying is strictly for fun, there should be no compromises made for safety."

Schweizer says its 1-30 meets these requirements. It has even proved impressive as a tow plane, successfully towing three different types of sailplanes, including a 2-place, weight 900 lbs, with good rate of climb. Here are Schweizer's design details for the 65-hp. 1-30:

Gr. Wt., lbs.	1,100
Empty Wt., lbs.	700
Useful Ld., lbs.	400
Fuel Cap., gals.	13
Top Spd., mph.	110
Cr. Spd., mph.	100
Stall Spd., mph.	38
Rate of Climb, fpm.	1,000
Take-Off Run, ft.	150-250
Landing Dist., ft.	200
Dist. to Clear 50-ft. Obstacle, ft.	360-480
Span, ft.	40
Length, ft.-ins.	20-3
Wing Aspect Ratio	10
Wing Area, sq. ft.	160

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The Scott AVIOX in Beautiful Luggage Case

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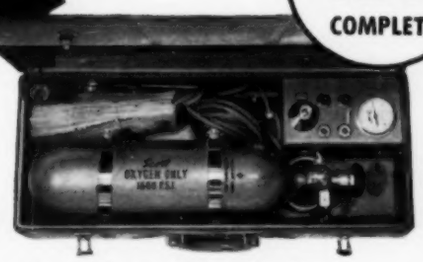

1 Complete Oxygen Breathing Equipment for Four.
2 Adjustable Altitude Control increases duration.
3 Can be used with spare oxygen cylinder for replacement in flight.
4 Everything — cylinder, regulator, masks and hose in a handsomely appointed leather case.
5 Charging Coupling and K.S. Masks included.
6 Provides the ultimate in efficiency and quality for those who want the best.

OR THIS

$115.25 LESS MASKS

The Scott EXECUTIVE

1 Lowest Price consistent with Quality.
2 Most compact and light-weight.
3 Serves two persons to 20,000 feet.
4 Duration time 5 hours—1 person. (2½ hrs. each for two.)

*C.A.A. Weight and Balance Data is not required.

Whichever you choose ... *Remember...*

Scott Builds the Best

When you choose an oxygen system for your aircraft, do it carefully. You will find that Scott builds the most complete line of business, executive airline and military oxygen equipment. You will find Scott sales, service and recharging facilities are the world's most widely known and respected. You always get the best value for your money when you buy Scott Breathing Equipment. Write for complete information.

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Oakland Airmotive's Super V Bonanza conversion features flush-mounted engine nacelles only 14 ins. deep. They contain 4-cylinder 170-hp. Lycoming engines equipped with Simmonds fuel injection. Super V has 1,500-lb. useful load at 3,400-lb. gross weight and has a 1,200-mile range at 206 mph., the firm says.

Super V Conversion

THERE are about 6,000 V-tailed 4-place single-engine Bonanzas in use and Oakland Airmotive in California is convinced it has a Super V twin-engine conversion which is so attractive in performance and cost that it will eventually change several hundred Bonanzas into fast, economical little twins. The Super V project was acquired by Oakland Airmotive from Dave Peterson of Tulsa, who has joined the California company.

This conversion consists of replacing its nose-mounted engine with two wing-mounted engines and performing a minimum of work or change elsewhere on the airplane. The new engines are 4-cylinder Lycoming O-340's, normally rated at 170 hp. each. But these engines are equipped with Simmonds fuel injection and will probably be rated at more than 170 hp. — Lycoming has not yet announced their certification and rating.

The Super V's big feature is that its engine nacelles are the flattest yet seen on an airplane, being only 14 ins. deep. They are described as "flush-mounted" nacelles to emphasize their low-drag frontal area.

With the engine change, the original Bonanza nose is replaced by a fiberglass nose section providing a forward baggage and equipment compartment, and the wing leading edge is reworked to provide extra fuel, 34 gals. to each wing. With two 20-gal. inboard bladder tanks, these give the Super V a total fuel supply of 108 gals.

Empty weight is 1,900 lbs., gross weight 3,400 lbs. and useful load is 1,500 lbs., Oakland Airmotive says.

At 3,400-lb. gross the firm's performance figures include 218-mph. top speed, 206-mph. cruise at 75% power, 196-mph. cruise at 65% power and 187-mph. cruise at 55% power. For cruising range, the 108-gal. fuel capacity provides 1,200 miles at 206 mph., 1,300 miles at 196 mph. and 1,400 miles at 187 mph.

Other performance claims include 1,550-fpm. rate of climb and 23,000-ft. service ceiling, with 400-fpm. climb and 10,000-ft. service ceiling for single-engine operation, with one propeller feathered. Minimum single-engine control speed is 75 mph. The airplane's stall speed is 65 mph. with flaps down, 72 with flaps up, and the Super V is said to get off the ground within 750 ft. with 10 degrees of flap and land within 600 ft. with 30 degrees of flap.

Oakland Airmotive expects to complete CAA certification of the Super V conversion in time to start deliveries early in 1959 and plans to franchise a number of modification centers throughout the country to make the conversions for Bonanza owners. Each of these centers will stock the Oakland Airmotive kits and, under average circumstances, should be able to convert a Bonanza into a Super V in 7 working days or less, Oakland Airmotive says. "It is anticipated that a package price of approximately $15,000 will cover the standard conversion," the firm stated.

Equipment included in the conversion consists of engines, Simmonds fuel injection system for each, starters, two 35-amp generators, two fuel boost pumps, two voltage regulators, two constant-speed, full-feathering Hartzell propellers, 108-gal. fuel system, flush-mounted nacelles, 25,000-BTU South Wind heater, dual cylinder head temperature gauge, dual manifold pressure gauge, dual tachometer, two engine gauge group (oil pressure, oil temperature, fuel pressure), 4-way fuel quantity indicator gauge and 2-way ammeter indicator.

The engines are dry sump and have flush-type rear accessory case. No cowl flaps, carburetor heat controls or mixture controls are used, fuel injection eliminating carburetor icing and providing automatic mixture control.

HERE'S THE SIGN OF THE FINEST SERVICE FOR YOUR PIPER AIRPLANE

Piper has established a world-wide network of Factory-Certified Service Centers to assure you of the finest service possible for your Piper airplane.
To earn the coveted designation, service organizations must meet rigid requirements, must be properly equipped and staffed by personnel who have attended the intensive service school conducted at the Piper plant.
Dozens of Piper Factory-Certified Service Centers have been established throughout the nation and around the world, and more are being designated to assure convenient and competent Piper service wherever you may wish to fly.

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UNion 3-3621 *UNion* 3-5394
Gallup, New Mexico

BROWNING AERIAL SERVICE
Municipal Airport
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HOmstead 5-1728
Austin, Texas

DES MOINES FLYING SERVICE, INC.
Municipal Airport
ATlantic 8-2218
Des Moines, Iowa

ELLIOTT FLYING SERVICE, INC.
Davenport Municipal Airport
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2-2689
Davenport, Iowa

EXECUTIVE AIRMOTIVE, INCORPORATED
Stewart Air Park
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Arfield 8-3581, *GArfield* 2-7277
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ELgin 5-6868
Sarasota, Florida

KEN-MAR AIRPARK, INC.
Ken-Mar Airpark
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MUrray 3-6589
Wichita, Kansas

LOUISIANA AIRCRAFT
Downtown Airport
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WAlnut 1-9618
Baton Rouge, Louisiana

OKLAHOMA AIRCRAFT SALES CO.
Ponca City Municipal Airport
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ROgers 5-3375
Ponca City, Oklahoma

PIEDMONT AVIATION, INC.
Smith Reynolds Airport
PArk 5-0511
Winston-Salem, North Carolina

RED AIRCRAFT SERVICE, INC.
Broward County International Airport, Building 78
JAckson 3-9624
Fort Lauderdale, Florida

SKYMOTIVE, INC.
O'Hare Field, Chicago International Airport
Chicago Telephone NAtional 5-6969
P. O. Box 448, Park Ridge, Illinois

SOUTHERN FLIGHT SERVICE, INC.
Douglas Municipal Airport
P. O. Box 1211
EXchange 9-6374
Charlotte, N. C.

SPARTAN AIRCRAFT COMPANY
Aviation Service Division
Tulsa Municipal Airport
TEmple 5-4491
Tulsa, Oklahoma

ST. LOUIS FLYING SERVICE
Lambert Municipal Airport
Box 6067, *Lambert Field Station*
PErshing 1-0450 & *PErshing* 1-1770
St. Louis, Missouri

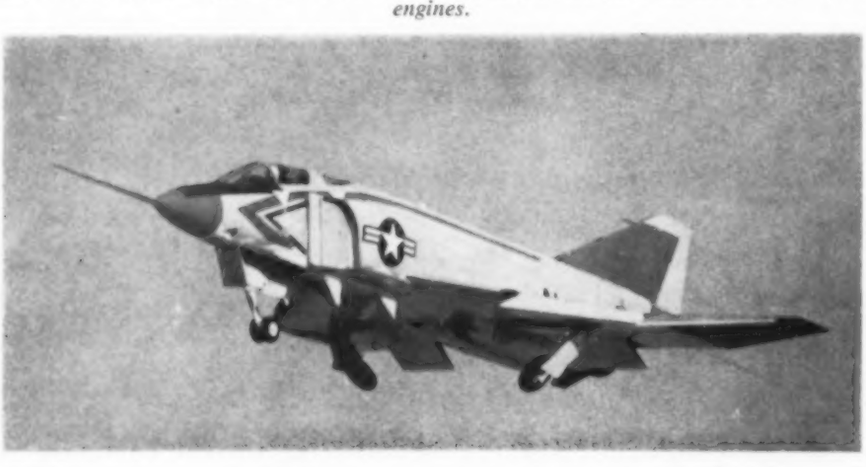
FIRST JET SEAPLANE STRIKING FORCE is 6 Navy P6M Seamasters, shown on the Martin Company's ramp at Baltimore. The 600-mph. seaplanes can carry 30,000-lb. payload of weapons each and can be used for toss bombing.

—(Martin Photos.)

FIRST REGULUS II LAUNCHING FROM SUBMARINE was made from the Grayback and shows supersonic Chance Vought missile just before its jet-assist unit was jettisoned.

—(Navy Photo.)

TWO OF THE NEWEST JET FIGHTERS FOR THE NAVY are the advanced Chance Vought F8U-3 Crusader (above) and the McDonnell F4H (below). Latter has 30,000 lbs. of thrust from two GE J-79 jets and impressive performance on one of its engines.



AIR REPORT

(Continued from page 5)

over 1957 sales of $32.6 million, military sales were up over $8 million to $41.9 million and hydraulic sales were up a million.

THRUST REVERSERS ON THE BOEING 707 have stopped the big jet airliner within 7,500 ft. after landing without the use of wheel brakes.

BEECH AIRCRAFT CORP. SALES exceeded $93,000,000 in fiscal 1958 and the directors voted a 40-cent quarterly dividend to boost the year's dividends to a total of $1.60 per share as compared to $1.20 last year. . . . **BEECH HAS A NEW $7,000,000 FOLLOW-ON CONTRACT** from Convair for major F-106A Air Force fighter assemblies.

AERO DESIGN AND ENGINEERING COMPANY officers and directors were re-elected last month at the annual stockholders meeting of the company, a wholly-owned subsidiary of Rockwell-Standard Corp. and manufacturer of Aero Commanders. Col. W. F. Rockwell is chairman and George T. Pew is president. Tom Harris, director of marketing, was elected a vice president.

HILLER AIRCRAFT WILL BUILD 5 ONE-MAN ROTORCYCLES on a new Navy contract, with September, 1959, delivery to the Marines for field evaluation. Hiller will build an additional quantity of Rotorcycles with the 5 military machines and some of the extras will be sold to European military and civilian agencies for evaluation. The small 300-lb. Rotorcycle is powered by a 43-hp. Nelson H-63B aircooled engine, has a 256-lb. useful load, will climb 1,160 fpm., has a 13,200-ft. service ceiling and 70-mph. top speed.

TAYLORCRAFT, INC., Pittsburgh, has elected Lance Call as president, with Ben Mauro continuing on the board as assistant to the president. Call was associated with Chase Aircraft and Kellett Aircraft after resigning from the Air Force as a general.

CUSTER FRAZER CORP., of New York has been formed for the manufacture, licensing and sales of the Custer Channel Wing light-twin business plane, with the craft's designer, Willard R. Custer being joined in the new firm by Joseph W. Frazer, former president of Kaiser-Frazer Corp., the auto company. A Canadian firm, Custer Channel Wing, Ltd., Montreal, reportedly will produce 100 of the channel-wing twins for the New York firm.

GENERAL AVIATION COUNCIL is new name for the General Aviation Facilities Planning Group. It is composed of 11 national aviation organizations including both trade and consumer groups. GAFPG was originally formed to supply factual data concerning general aviation's operational patterns and future requirements to President Eisenhower's special assistant for aviation facilities planning.

WORLD CONGRESS OF FLIGHT, sponsored by the Air Force Association, is planned for April 12-19 at Las Vegas, Nevada, in the new $10,000,000 Las Vegas Convention Center. The Congress will emphasize flight and static exhibits of military and commercial aircraft from helicopters to jet transports. The sponsor hopes to combine regular meetings of many individual organizations into one place at the same time. It also hopes to encourage international participation and the program would be similar to that employed at the annual British Farnborough Display.

LOCKHEED HAS A TWIN-PROP-JET STOL-VTOL DESIGN closely resembling an experimental craft using piston engines and now being readied for full transitional flight by Aero Design & Engineering, manufacturers of the Aero Commander. The Lockheed, designated CL-379, is still in the wind-tunnel engineering stage and would use two 800-hp. Lycoming prop-jet engines for vectored slipstream and a tilting wing, with which incidence could be varied 20 degrees. It is a small twin, with stub wing, and would gross about 5,000 lbs.

BELL AIRCRAFT'S AUTOMATIC AIRCRAFT LANDING SYSTEM has been demonstrated to representatives of the Airways Modernization Board and the Civil Aeronautics Administration. A commercial version of the system was used, with the government representatives riding as passengers in a twin-engine commercial airplane which made nine "perfect" automatic landings. Employing a combination of radar and radio, the Bell system "locks on" an approaching aircraft from 2 to 4 miles off the end of the runway. Radar locates the airplane and tracks it en route and radio links the plane's autopilot to the system which feeds the autopilot necessary correction signals to make the landing in zero-zero conditions. Designed for carrier operations, the system landed a jet fighter 100 times on a carrier and has landed military and commercial single and multi-engine aircraft hundreds of times, including the Boeing 707 jet airliner. Only additional equipment needed on the airplane is a metal corner reflector for pin-point radar return.

AGE HAS BEEN NO LIMIT for Swan F. Anderson, business flier of Rockford, Illinois. At 79, he is now taking instruction for an instrument rating, after earning his multi-engine rating earlier this year in his company's Beech Travel Air. He soloed in 1940 at age 62. Beech Aircraft and Butler Aviation honored him recently as one of America's most interesting business fliers. A serious eye operation almost ended his flying at age 77, but 15 months later he renewed his pilot's license with contact lenses and is now going strong in the twin-engine Travel Air.

ACTIVE U. S. CIVIL AIRCRAFT REGISTRATIONS totaled 67,153 as of Jan. 1, 1958, the CAA's last tabulation, as compared with 64,688 the preceding year. Airliners totaled 1,864 in number, up from 1,802 the preceding year. Over one-third of all the active aircraft are based in five states, these being California, Texas, Illinois, Ohio and New York. These facts are from "U. S. Active Civil Aircraft by State and County," 50 cents, Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

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NEW LOBBY AT LOS ANGELES BUSINESS FLYING SERVICE CENTER has been added by AiResearch Aviation Service, Los Angeles International Airport. The three-sided glass enclosure is comfortably furnished and has an adjoining pilots ready room.

NATIONWIDE ROUNDUP:

New Business In the Hangar

INCREASED PAYLOADS AND REDUCED RUNWAY LENGTH REQUIREMENTS for transport category aircraft equipped with Aerojet-General standby rocket engines are provided by a new Special Civil Air Regulation SR-426, which became effective last month. The Jato units are used for emergencies only.

ADDISON AIRPORT, privately-owned Dallas executive airport, has signed contracts with two companies which will construct new hangar facilities there. Brown Aero, Aero Commander and Lycoming distributor, will construct a 9,600-sq. ft. hangar and 1,500 ft. of office space, and Airpark Co. has started construction of a 16,000-sq. ft. hangar and office space to be used for storage of twins including DC-3's. Thomas G. Leachman, Jr., heads Airpark Co., whose new hangar will have a 3,000-sq. ft. office-lounge area. John Brown, president, and Bill White, vice president of Brown Aero, said their new facility will be sales and service headquarters for their Aero Commander distributorship. Other operators on the field include Dal-Tex Aviation, Cessna dealer; Collins Radio, Riteway Airmotive, J. R. Gray and Delhi-Taylor Oil Co. William T. Overton, president of the airport, said the new $2,000,000 facility completed its first year last month with an impressive growth in activity. The airport now averages 5,400 landings and take-offs monthly and has 138 private planes based there, of which 38 are multi-engine. Over 200 persons are employed there and Manager Henry Stuart says fuel sales will pass the 750,000-gal. mark this year. The 24-hr. airport has its own private terminal omni range station for instrument operations under Dallas Approach Control and its own private terminal building and restaurant.

REMMERT-WERNER, INC., Lambert Field, St. Louis, installed lightweight landing gear doors on Peabody Coal's Super-92 DC-3, Bob Boyanovsky and Bill Frame, crew, during a 100-hr. inspection. . . . Ralph Piper had new de-icer boots installed on his Monsanto Chemical DC-3. . . . H. C. Price Construction's DC-3, crewed by Pinky McMillon and Ed Thaggart, was in for installation of Collins 17L7-51X2 VHF communications, Collins 51X2 VOR-102 omni and dual ARC 21 lightweight ADF's. . . . Other jobs last month included ground blowers added to the Janitrol heater on Lou Rinebold's Callery Chemical DC-3; installation of an Engine Works R985 engine on TV Associates' Twin Beech; engine change for Dinny Heiligenstein's Luhr Brothers Twin-Bonanza and, at Toledo, installation of an Engine Works R1830-94 engine on Larry Lyons' Denison Engineering DC-3.

BELDEX CORP., Chester Airport, Perryville, Missouri, had Montex Drilling's DC-3 (Walter Word and Harry Hansen, pilots) in for a new interior with a picture window, one-piece bird-proof windshields, pilots bulkhead removal, new airstair door, installation of RCA AVQ-50 radar with Remmert-Werner radome, ARC Type 210 360-channel VHF communications, dual ARC 21A ADF's, dual Collins 51R3 omni's, HF transceiver, Sperry H5 electric gyro horizon, custom radio panel and SAE lighted in-

strument panel. . . . Austin Goodwin's Houston Lumber Super-92 DC-3 had an RCA AVQ-50 radar installed, along with a 200,000-BTU Janitrol heater, automatic heat controls and ground blowers. . . . Chemstrand Corporation, Bob Hinds, pilot, has taken delivery of a new Super-92 DC-3, equipment including lightweight landing gear doors, retractable tail wheel, Collins 17L7-51X2 VHF communications, ARC Type 210 VHF transceiver, dual Collins 51R3 omni's with 51V glideslope, Collins 51Z marker, dual ARC 21A ADF's, custom radio, electrical and instrument panels, picture windows, Acrilan carpet and fabric. . . . Ontario Paper's Super-92 DC-3, piloted by Fred Hotson and Andy Gabure, was in for engine change and installation of lightweight landing gear doors and aileron gap strips.

EXECUTIVE AIRCRAFT SERVICE, Red Bird Airport, Dallas, had John Lyons' Malco Refining Lodestar in for miscellaneous work. . . . Paul Cass brought in his Gulf Oil Lodestar for fuel tank repairs and 100-hr. inspection. . . . Radio equipment was replaced in State National Life Insurance Company's Apache and a new Narco Mark V transceiver was installed.

GARRETT CORPORATION'S AIRESEARCH AVIATION SERVICE DIVISION, Los Angeles International Airport, has received Phillips Petroleum's Convair 340 for a double engine change, miscellaneous service bulletins and interior items. Pilot is Clarence Clark. . . . World Airways has contracted for turn-around service, freight handling inspection and maintenance on their C-118 and C-54 aircraft during the coming year. . . . Canadian Pacific Airlines has a DC-6A in the shop for modification to DC-6B configuration and interior work. . . . Charles Johnson and Moss Hargan have flown in their Reynolds Metals DC-3 for various service items. . . . Maintenance was performed for International Business Machine's DC-3.

DAL-TEX AVIATION, Addison Airport, Dallas, has reorganized with Emmett (Zeke) Evans as sales manager and Homer Penwell as special service salesman. T. O. Wright is manager of the service department. Edward T. Skinner is president.

TIMMINS AVIATION, LTD., Montreal Airport, is equipping its shops to service the new Grumman Gulfstream, for which it is a distributor, and will send its personnel to the manufacturer for training in Grumman, Rolls Royce and Rotol factory methods. In addition, a Grumman representative will be permanently attached to Timmins. Two Timmins customers have deposits for Gulfstream deliveries next summer and several other Canadian companies are expected to order the new propjet. . . . Timmins has heated hangar space available at Kingston for winter aircraft storage. . . . A Beech D18S has been delivered to North Rankin Nickel Mines, Northwest Territories, Capt. J. Amodio. . . . Blackie Bradshaw and John Sefsik brought in Quebec Cartier Mining's DC-3 for engine change. . . . Tom Caladine's Perini-McNamara-Quemont Construction amphibious de-Havilland Otter was in for a No. 2 check.

AERO CORPORATION OF ATLANTA, Municipal Airport, Atlanta, has received a new contract from CAA for periodic checks covering its aircraft as needed and from Redstone Arsenal for maintenance of airborne and ground electronic equipment. . . . The Pesco Products Aero Commander received an X-ray inspection. . . . Three Grumman Gooses are receiving extensive overhaul and modification for the government of Paraguay.

SPARTAN AIRCRAFT CO., Municipal Airport, Tulsa, replaced control cables and performed miscellaneous instrument and radio work for A. B. Berkstresser's Ashland Oil and Refining's Lodestar. . . . Bud Meredith brought in Reynolds Metal's Beechcraft for service. . . . Modifications for cabin interior and exterior painting were completed on Sharp Drilling's Beechcraft for Chief Pilot Jay Gentry. . . . Frank Ernst brought

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in his Franklin Supply de Havilland Dove for miscellaneous work. . . . Luke Mosely's Pepsi Cola Lodestar received a periodic inspection and replacement of de-icer boots. . . . Al Litzenberger's Mesta Machine A-26 was returned to service after an engine change. . . . W. C. Mims had radio work on his Murchison Brothers Aero Commander. . . . Double engine change and overhaul of accessories and props were performed on a Warren Petroleum Beech. . . . In for miscellaneous work and inspections were Dale Smith's Wood Oil Cessna 310 and Harry Horton's Apache.

AIRTECH SERVICE, INC., Miami International Airport, has been appointed as a dealer by Airwork Corp., which reports that Airtech has 35 employes and most of their work is on corporate aircraft including DC-3's, C-46's and Convairs.

W. H. COFFIN AIR SERVICE, Whiteman Air Park, Pacoima, California, is expanding its aircraft ferrying service. This service was begun in 1944 with deliveries to Alaska, South America and the Far East. Coffin employs only ATR-rated pilots and CAA-certified navigators. They have delivered single-engine and multi-engine aircraft to all parts of the world. Coffin says he has never lost a pilot or damaged an airplane in 15 years of ferrying.

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DALLAS AERO SERVICE, Love Field, Dallas, has a Phillips Petroleum Lodestar, brought in by Billy Parker, for extensive modification and conversion with the DAS safety-stability-speed kit, Bendix radar, complete radio installation, custom interior, paint job and complete rewiring. . . . Bill Powell brought in Russell Firestone's Lodestar for complete rewiring, wheel-well doors, shock panels on the fuselage, complete radio installation, custom instrument panel, custom radio panel and custom electrical subpanel. . . . Parker Equipment, Odessa, Fred Clayton, pilot, brought in its Lodestar for complete safety-stability-speed kit and double engine change. . . . Hudson Flying Service's C18S Beech is getting an angle of incidence change. . . . Another Central Airlines DC-3 is in the shop for 11,000-hr. overhaul. . . . Gordon Koontz' Oklahoma Pipe Line DC-3 is in for new de-icer boots. . . . Joe Lacey brought in a Sinclair Refining de Havilland Dove for installation of exhaust augmentors and Janitrol heater. . . . Double engine changes were performed on Central Oil's Aero Commander and Dresser Ideco's Aero Commander.

"JONES NORTH AMERICAN AM-FM RADIO-TV STATION LISTINGS" is a handy-size booklet listing over 5,000 stations and their frequencies. It is available at 50 cents from Vane A. Jones Co., 3749 N. Keystone Ave., Indianapolis, Indiana.

LAWTHER CHEMICALS, 3550 Touhy Ave., Chicago, is now marketing Bold Jet-Spray "safety-sight" flourescent colors in 16-oz. aerosol spray cans for pilots and operators. Filtering clear sealer is also offered in 16-oz. Aerosol cans.

CIVIL AIR REGULATIONS AMENDMENT 3-4, effective last month, no longer makes it mandatory that utility category airplanes incorporate suitable provisions for the quick bail out of occupants with parachutes. Operators of those utility category airplanes now have the option of incorporating such egress provisions if they desire or to operate without them. Emergency rip-pin door hinges or the equivalent are no longer required for utility category airplanes.

FREDERICK B. AYER & ASSOCIATES, New York, active in the Convair resale market, has contracted to buy two Douglas DC-6B's from Continental Airlines and plans to buy a substantial number of 6B's for resale. Ayer is offering 66-passenger DC-6B at $775,000 and 102-passenger version at $875,000. He expects the DC-6 eventually to replace the DC-3 as the workhorse of the airways.

AERO QUALITY SALES COMPANY, 13711 E. Seven Mile Road, Detroit, has a new brochure listing CAA-approved Sonotone sintered-

plate cadmium aircraft battery installations for many commercial lightplanes and twins as well as transports. Sonotone batteries are valued for their light weight and rapid recharge rate.

TOPP MANUFACTURING CO., Los Angeles, has announced names of 11 distributors for its new line of airborne radio communication and navigation equipment. Aviation Sales Manager Henry H. Hamm listed the Topp distributors as follows: Tucson Aviation, Arizona; Howard Aero, San Antonio; Matthews Electronics, San Antonio and Corpus Christi; Cruse Aviation, Houston; Cutter-Carr Flying Service, Albuquerque; Hawkes Aviation, Phoenix; Executive Radio & Aircraft Co., Santa Monica; Dot Electronics, Lindenhurst, N. Y.; Hair Flying Service, Baton Rouge; Air Oasis, Long Beach, and Avio-Diepens, Holland. . . . First product in the new Topp line is the "Topper," an emergency stand-by receiver, crystal controlled and weighing less than 5 lbs. It is now in production.

FIN-TIP PROBE ANTENNA, on the top of the tail fin of the Boeing 707 airliner, is said by Boeing to give performance equal or superior to wire antennas. Actual in-flight comparisons were made to confirm the performance of the high-frequency antenna, a low-drag probe jutting forward from the fin cap.

CENTRAL SOLVENTS & CHEMICALS CO., 2540 West Flournoy St., Chicago, has available for private and commercial aircraft a combination of propylene glycol, ethylene glycol, wetting agents, defoamer and corrosion inhibitor called "Dow Deicing Fluid 20," said to have superior ice melting ability and will not affect doped fabrics, painted surfaces, rubber de-icer shoes or plastics.

AERONAUTICAL ENGINEERING AND SERVICE CORP., 3101 Pico Boulevard, Santa Monica, has been named West Coast representative by Edo Corp., as Edo Airborne Loran is installed in jet airliners being built by Boeing, Douglas, Convair and Lockheed.

SIERRACOTE ELECTRICALLY-HEATED AIRCRAFT WINDSHIELDS for private and commercial aircraft are described in a new bulletin available from the Sierracin Corp., 903 N. Victory Blvd., Burbank. The windshields are now available for DC-3, Lodestar and PV-1 aircraft and are being developed for others including lightplanes.

LEARCAL DIVISION OF LEAR, INC., Santa Monica, has opened a new sales and service office in Miami for its flight control, navigation and communication radio for private, corporate and transport aircraft. The new office is in the International City Building, 4471 NW 36th St., Miami, and is managed by E. A. Bostelmann. . . . **NEW LEAR NINE-IN-ONE FLIGHT INDICATOR,** which displays course selection, reciprocal course heading, to-from, later course deviation, glideslope indication, glideslope flag alarm, localizer indicator, localizer flag alarm and heading changes, is described in a new brochure available from Lear, Inc., 3171 S. Bundy Drive, Santa Monica.

ATKINS CAPACITANCE-DISCHARGE AIRCRAFT ANTI-COLLISION LIGHT will be further developed, manufactured and marketed by Minneapolis-Honeywell under a licensing agreement with Atkins Light Co., Minneapolis, which will have international sales rights for business aircraft and private plane owners. The high-intensity rapidly-flashing light provides pilots an aid in reducing collisions and near-misses. It was designed especially for daylight operations by H. Willia, (Bill) Atkins, a pilot for Northwest Airlines.

VINYL PLASTIC TAPE TO PROTECT LEADING EDGES of aircraft wings, vertical fins, stabilizers, loop housings and pitot masts from abrasion by stones and rain, is available from the Plastape Co., Westchester County Airport, Hangar A, White Plains, N. Y. The tape comes in various widths from 2 to 8 ins. and is easy to apply and remove.

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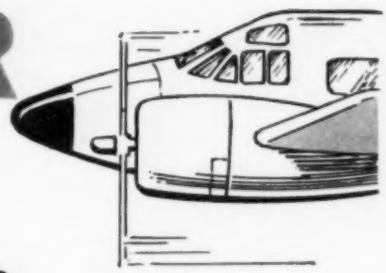

Here's important news for business aircraft owners. Now available at Cair . . . a special Radar Lease Plan to cover cost of your complete new weather radar system, including installation. You can enjoy the advantages of radar now with no capital expenditure . . . handle lease payments as tax-deductible operating expense. This plan can be applied to all types of radar in all types of aircraft. The lease can be written to suit your specific requirements.

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Dallas, Texas

Hair Flying Service
Harding Field
Baton Rouge, Louisiana

Poelman Aircraft Co.
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New Orleans, Louisiana

Ragsdale Flying Service
Municipal Airport
Austin, Texas

Kenneth Starnes Aviation Service
Adams Field
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Southwestern Skyways, Inc.
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Santa Fe, New Mexico
and Ogden, Utah

Sunny South Aircraft Service, Inc.
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55 NBAA Pilots Top Million Miles Without Accident

One hundred and fifty business pilots received National Business Aircraft Association annual membership safety awards at the group's recent annual convention for having flown 500,000 or more consecutive miles without accident or injury — 55 of them with records of more than 1,000,000 accident-free miles in business aircraft. In addition, 47 member corporations received awards for having completed 1,000,000 or more accident-free business-plane miles. The list of pilots, grouped by accident-free mileage flown, is as follows:

1,500,000-3,000,000 Miles

Nelson U. Rokes, Procter & Gamble, Cincinnati, 3,175,000; J. R. Siedner, Goodyear, Akron, 2,118,510; Lawrence N. Lacey, Triangle Conduit, New Brunswick, N. J., 1,776,000; W. G. Jennings, AiResearch, Los Angeles, 1,700,000; S. A. Merrill, Goodyear, Akron, 1,659,000; B. Owen Mayfield, Hercules Powder, Wilmington, 1,547,-309.

1,300,000-1,400,000 Miles

John R. Dunham, Continental Can, Morristown, N. J., 1,468,750; J. Sheldon Lewis, Thatcher Glass, Elmira, N. Y., 1,431,250; George W. Sherwood, Briggs Manufacturing, Warren, Mich., 1,418,940; Richard N. Thurston, Monsanto Chemical, St. Louis, 1,373,551; George E. Meyers, Monsanto, 1,349,-963; Norman L. Mitchell, Minneapolis Star & Tribune, 1,341,725; William P. Hobson, Hercules Powder, 1,337,989; Raoul Castro, International Harvester, Chicago, 1,337,486; Joseph J. Budro, Jr., Champion Paper, Hamilton, O., 1,327,737; Orville Sparks, Holley Carburetor, Van Dyke, Mich., 1,318,931; Carl Lund, International Paper, Mobile, 1,310,635.

1,200,000 Miles

Robert L. Hansen, Kroehler Manufacturing, Naperville, Ill.; C. M. Hayes, Traylor Brothers, Evansville, Ind.; L. P. Cornwall, Chrysler, Detroit; Ralph Piper, Monsanto; W. R. Dotter, International Harvester; James E. Kidd, Anchor Hocking Glass, Lancaster, O.; A. K. Roden, Bechtel Corp., San Francisco; John A. Bouteller, Jr., Service Pipe Line, Tulsa; Philip Van Treuren, Dairypak, Cleveland; Harold Curtis, National Distillers, New York; A. C. Korb, Westinghouse Electric, Pittsburgh.

1,100,000 Miles

H. R. Anderson, Chrysler; Ray Goodwin, Wesley West Industries, Houston; B. N. Hadock, Falstaff, St. Louis; G. L. Hobbs, Beloit Iron, Beloit, Wisc.; Edwin C. Little, Westinghouse; Ernest Marquis, Cluett-Peabody, White Plains; Morris Morgan, Texas Eastern, Shreveport; Sam Safris, Butler Co., Chicago; William Watt, Hoover Co., North Canton, O., and

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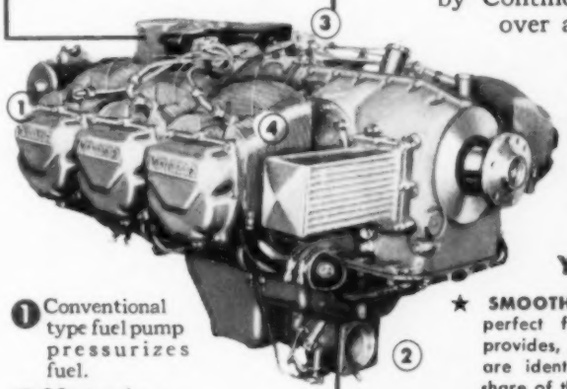

1. Conventional type fuel pump pressurizes fuel.
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★ **SMOOTHER OPERATION,** because with the perfect fuel distribution which the system provides, power impulses from all cylinders are identical. Each cylinder does an equal share of the work.

★ **GREATER ECONOMY,** because with each cylinder getting exactly the same amount of fuel, all cylinders can be leaned out uniformly for better economy. Lean-out needn't stop, as with a carburetor, when the leanest cylinder begins to starve while others could be leaned still further.

★ **INCREASED RANGE,** because fuel consumption can now be predicted accurately. Gauge on instrument panel is calibrated to correlate injection system pressure with fuel consumption, in gallons per hour.

★ **HIGHER HORSEPOWER** with no change in engine displacement. The engine "breathes" freely, with the carburetor's restriction to air flow removed.

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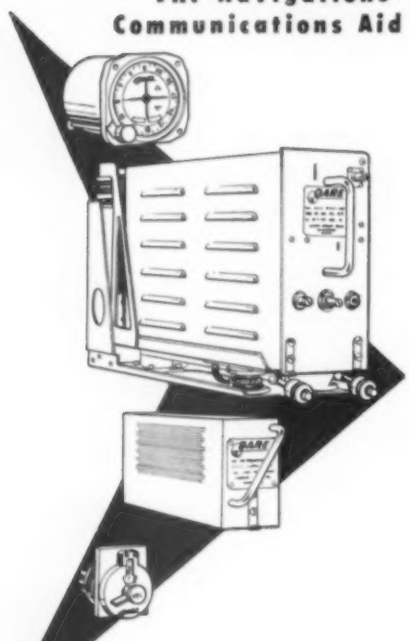

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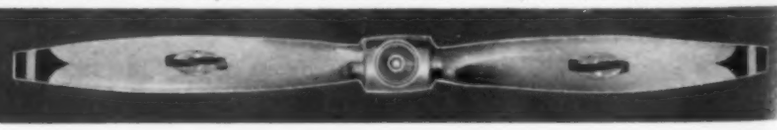

Gas; Charles Harmon, Lockport Felt; Robert Hinds, Chemstrand; William Kempp, Holley Carburetor; Manuel Kenwood, Northern Natural Gas; John Luchow, Procter & Gamble; James Magnus, Minneapolis-Honeywell; Gordon Malzer, Sinclair; Marshall McDowell, Gerstenslager Co.; Thomas McFarland, Ohio Oil; Allen Minich, Sinclair; Forest Polston, Sinclair; Donnell Severts, Service Pipe Line; Stanley Smith, N. Y. Wire Cloth; William Verran, Ohio Oil; Hubert Wells, Sinclair; Richard Whitbeck, Owens-Illinois; James Wolfe, Service Pipe Line, and Horace Wood, Gillette Co.

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Need For IFR Radio Equipment Standards Cited By Aircraft Electronics Association

THE Aircraft Electronics Association, which represents 42 aircraft electronics sales, service and installation shops throughout the U. S., has reported to the Civil Aeronautics Board's Bureau of Safety that it supports and endorses the purpose of CAB Draft Release 58-8, which would require minimum performance standards for radio and navigation equipment aboard all aircraft operating under instrument flight rules.

E. E. (Gene) Baker of Chamberlain Aviation, Inc., Akron, Ohio, submitted to CAB the AEA statement in commenting on the proposed regulation. The AEA statement suggested the adoption of test requirements for temporary approval of electronic radio equipment for IFR flight.

Baker's AEA statement suggested that the regulation should contain a stated allowance for an adequate delay period for compliance and the inclusion of a clearly-defined method for obtaining temporary approval for equipment now in use which was not designed to TSO specifications but which has proven its service accuracy and reliability during years of satisfactory operation and maintenance history. AEA suggested that equipment currently manufactured and installed or to be installed within two years after the proposed regulation becomes effective should be temporarily approved by the CAA for a period not exceeding 6 years, provided it meets minimum suggested performance standards.

These suggested minimum performance standards or test requirements were outlined as follows by AEA:

"Equipment must be adjusted, calibrated and installed in accordance with manufacturers' instructions. Actual flight tests will be used, each to be conducted on at least two different days on at least two different ground station combinations and repeated sufficiently for 5 sets of data on each ground station combination (this because accuracy will depend on ground stations as well as airborne equipment).

VHF Communication Equipment: At minimum instrument altitude on a typical airway, satisfactory communication must be maintained with the appropriate ground station at the maximum distance between stations.

VOR Receiving Equipment: At minimum instrument altitude on a typical VHF airway, satisfactory bearings with errors not exceeding 4 degrees must be maintained at maximum distance between stations.

Low Frequency Receiving and Direction Finding Equipment: At mini-

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mum instrument altitude along a typical LF airway, readable range position and identification signals must be received at maximum distance between stations and satisfactory bearings must be obtained to an accuracy of plus or minus 5 degrees fore and aft and station passage indications must be within plus or minus 1 mile of actual visual passage. Also, cross bearings at intersecting airways must indicate position within the confines of the intersecting airway.

Marker Beacon Receiving Equipment: During a typical flight on a typical airway and including a simulated instrument approach, aural and/or visual indications of passing over the 75-mc Z-fan inner and outer markers must be available and easily identifiable.

ILS Localizer Receiving Equipment: During a typical simulated ILS approach, satisfactory localizer signals must be available from at least the outer marker inbound. These signals must be sufficiently accurate to bring the airplane to within 100 ft. laterally of the center of the localizer runway.

Auxiliary Equipment: Any and all auxiliary equipment which affects operational use of the primary communications and navigation equipment must not affect the primary equipment beyond the accuracies specified.

In order to evaluate the test results, the errors in the series of tests should be averaged for each equipment and the average should not exceed the limits specified.

AEA recommended that the regulation should include a clear and concise statement as to what constitutes "major" and "minor" repairs, describing this as the crux of the whole situation requiring the combined effort of the industry for its satisfactory application. In some cases, the statement added, the replacement of a vacuum tube can change the accuracy of a navigation receiver and this fact dictates the need for radio-electronics competence in certain repairs and maintenance which may appear to be minor in nature.

The Association's additional recommendations included these: (1) Inspections of radio repair stations should be made by CAA representatives possessing specialized training and experience in aircraft radio and electronics; (2) a team of CAA electronics specialists should tour all unapproved aircraft radio shops and actively assist and advise them in obtaining CAA approval; (3) present regulations covering bearing accuracy checks of VOR equipment should be enforced and extended to cover other items of navigation equipment used for instrument flight; (4) an appendix should be added to Part 52 of CAR in the form of a sample "inspection manual for radio repair stations," this encompassing CAA requirements but the manual's use being non-mandatory and considered as a help and encouragement for approval for more radio repair stations; (5) CAA should establish procedure for expeditious and uniform interpretation of the intent of the regulations in any cases where interpretation is not clear or uniform in various regions.

In other recent communications, Baker has suggested the following minimums in radio equipment as being necessary for reliable instrument flying: (1) Dual transmitters including necessary frequencies for proposed flight; (2) dual communication receivers with necessary frequency coverage for proposed flight (these receivers may also be used for VHF navigation); (3) dual navigation receivers, at least one of which must be capable of VOR and ILS localizer reception; (4) single LF or ADF receiver which may be included as a navigation receiver; (5) single marker beacon receiver (may be part of another receiver).

Transistorized ADF Works On "Dead" Battery

HERMAN E. Lacy, president of Hydroforming Company of America, 7400 West Lawrence Avenue, Chicago, recently experienced failure of both generators in his light twin while on instruments in the "soup" but discovered his new trans-

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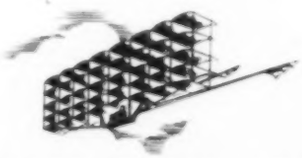
istorized ADF used so little electrical current that it would operate after the battery was too weak to illuminate the marker beacon light. He writes as follows:

"On a recent instrument flight from Cleveland to Washington, I had 125 miles of front to go through and was assigned 6,000 ft. After being in the soup for about 20 minutes, both generators went out and in a very few moments I was without electricity of any kind — the battery was so dead that even the marker beacon light would not operate.

"But my new Lear ADF-100 worked — because it is transistorized, it uses very little current. Dead as my battery was, the ADF-100 needle registered sharp as I tuned from station to station and continued on the right track.

"I had installed the ADF-100 only recently for the primary purpose of saving weight, this being about 10 lbs. over the perfectly good ADF-14 which it replaced. I value it now because it operates on practically no current at all with the battery dead. This ought to be published because maybe it will save someone else's life — if they are smart enough to realize that the unexpected can happen in an airplane and usually at the wrong time! I strongly advise others to replace their old ADF's and radios with transistorized equipment."



Francis Herbert Wenham, noted English engineer and charter member of the Royal Aeronautical Society, obtained, in 1866, the first patent on a flying machine with superimposed wings, earning for him the appellation, "Father of the Biplane."

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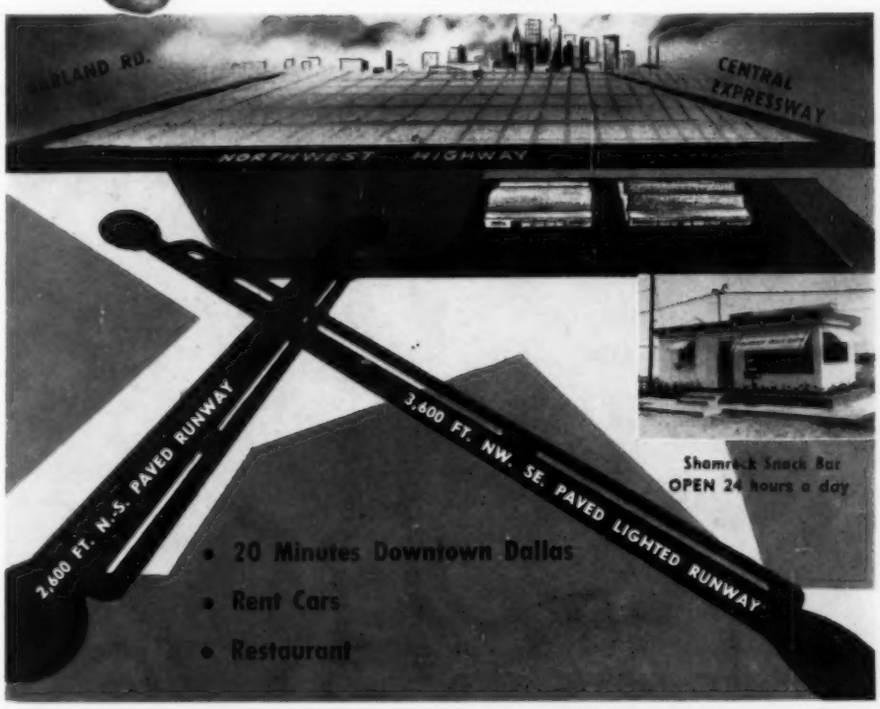

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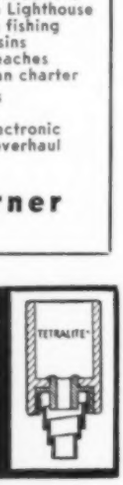

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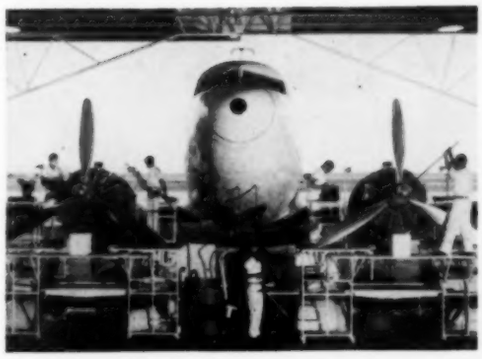

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